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Improving the Office Product and Operations

by CARL E. LINDQUIST

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The present author points out significantly that office personnel "make" and "do" in the course of their jobs in a manner not essentially different from that of employees in the plant. He concludes that considered and systematic effort to apply sound management principles applies equally well to both fields and offers related procedures.

THE SUBJECT OF CLERICAL COST REDUCTION is a very important one in every industry. Contributing to the importance are the tremendous increase in pay levels experienced over the last decade and the disproportionate increase of clerical over factory personnel, which has been in the ratio of 2½ to 1 since the turn of the century. A question arises with regard to this disparity. Why should one group increase so much more quickly than another? It seems to me that a great portion of the difference is due to the utilization of scientific management principles as they apply to one group and the lack of utilization of those principles as they apply to the other.

Still, if this be granted, how important is clerical cost reduction in particular instances? Each industrial accountant knows what amount and percentage of his own company's total cost of doing business lies in clerical expense and each can visualize what the effect on his company would be if he could substantially reduce that cost. The opportunity to increase profits and raise morale in the company is ordinarily a large one. In fact, a noted industrialist has estimated that clerical effort in many companies is 30 to 40 per cent inefficient.

Three Factors of Efficiency in Shop or Office

On the comparable line of thinking, industry for many years has devoted considerable time and effort to the effective use of shop labor. The same type of effort should be expended on office work.

As applied in the plant, this effective effort has included: (1) product development, (2) operation or method development, and (3) incentive development. An example of product development which might be cited is one we are all acquainted with, the radio. We all remember the size of the condensers in the radios twenty years ago. The cost of them was in proportion to their size. Through product development this component was reduced 1/20th or less of its former size and the cost, in general, reduced correspondingly. An example of operation or method development is offered by insulated wire. Twenty years ago many individual processes were required to produce insulated wire. Today the entire operation, including testing and winding on reels, is performed by one highly specialized machine. As for incentives, we all have some acquaintance with the various types of wage incentive plans in use, such as individual piece rates, group piece rates, standard time, and other similar schemes of rewarding shop labor for extra effort expended in turning out a greater quantity of the product in the same elapsed time.

It is thus that industry, as a whole, has expended considerable time, thought and effort to obtain the maximum use from labor effort in the factory. The same cannot be said, in general, of industry's effort with respect to its office personnel. As one corrective force it may be commented that cost accountants have the same responsibility to aid management as in regard to direct labor. There is need for all three types of improvement, namely (1) product, (2) operation, and (3) incentive. The field of incentive development is a field for separate treatment. This article will be confined to the first two types of improvement, i.e., clerical product and clerical operation, except to point out where the proper coordination of these makes incentive development easier.

Clerical Product Improvement

The product of clerical effort may be a paper that states what is to be done such as a shipping bill, the completed item such as the paid invoice, or the control item such as a report to management to aid in running the business. These products can be developed in the same manner as the products of the shop. As the condensers of 20 years ago were improved and at a lower cost, so can the office product be improved and at a lower cost. However, the same effort must be expended if the office product is to be improved as was expended in improving the shop product. The shipping bill, the paid invoice, or the report all require study to streamline them and reduce the work input to an absolute minimum without sacrificing quality.

The concept of product must not be regarded narrowly. For instance, how is the retention of records product? Are those being retained that should not be? Are they being kept too long? Is there a records management program? Should not all the products of the office be looked at critically to determine whether a practical product has been obtained from the efforts of the office workers? Conversely, are there any items which can be done without?

In reviewing items in order to determine their value in the light of their cost, a bench mark of a previous period is very beneficial. I would suggest a period prior to World War II, say 1941, as most helpful. What overhead items were required then, what now? An analysis by organizations of the number of employees classifiable in overhead in 1941 and now, might be very illuminating. It is particularly interesting to compile a list of office products which caused the increase. A proper presentation to and review by management might eliminate many of them.

A part of this presentation would be an analysis of each item of expense compared with 1941, both as to dollar amount and physical unit and by organizations incurring the expense. As examples, items that might be so analyzed are:

1. **Employee publications**
   - Number of pages
   - Number of issues
   - Source of printing
   - Type of data
   - Necessity for each
2. **Rent**
   - Amount of space
   - Outlying locations
   - "Frills", private office, tables
   - Records management
   - Qualified personnel on layout
3. **Stationery**
   - Amount
   - Kind
4. **Contributions and memberships**
   - Desirability
   - Amount or number
5. **Traveling, entertainment and conferences**
   - Benefits commensurate
   - Prior consideration necessity

Better Clerical Operating Methods

As the second factor in the reduction of shop labor cost has been considered to be operation or method development, so also this is the second phase in clerical cost reduction. For the engineer to reduce the cost of insulating wire it was necessary for him to know the operations involved. To reduce clerical costs it is also just as important to know the operations involved. For many companies there are realizable savings of up to 25 per cent in this field.

The starting point for efficiency in office operations is a sound organization. Organization implies not only the organizing of the general departments but also the organizing of the smaller units or functions. A good organization requires

careful planning and synchronization of every function so that, when completed, all fit together like the pieces in a jigsaw puzzle. However, it is not enough that the pieces fit. The individual office workers must be able to assemble them into the finished puzzle, day after day. Just as a picture pasted to pieces of wood makes it possible for most people to work a jigsaw puzzle, so in a business a picture must be added to the organization set-up if it is to function properly. This picture is a composite of two things: (1) a written organization chart with specified functions and (2) written office job layouts with "should-take" time. The white areas in Exhibit 1 present this idea.

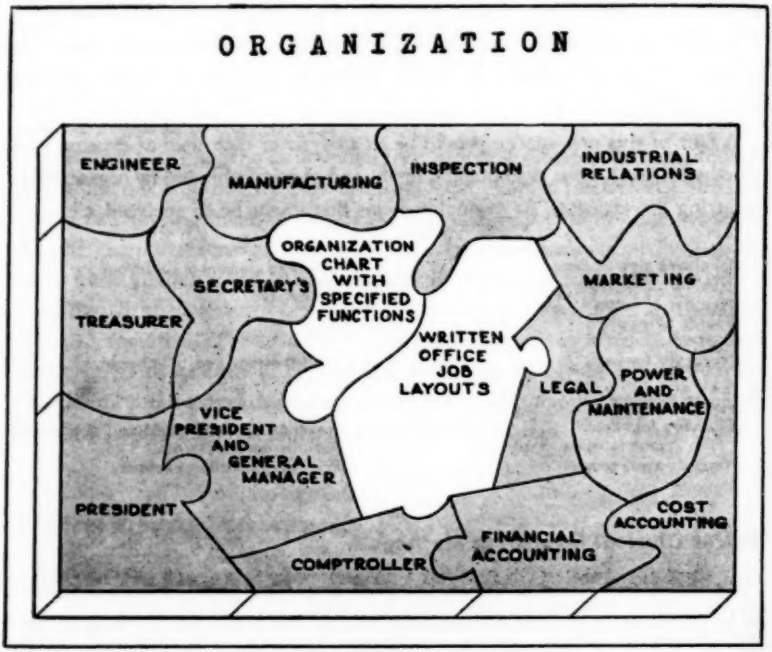
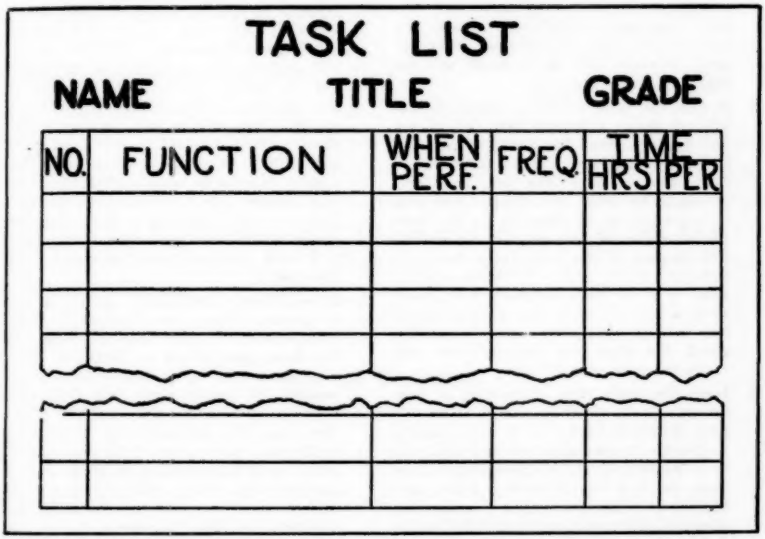


EXHIBIT 1

An organization run without written instructions is generally incapable of progressive advance. Not only does the business suffer from the absence of such instructions but too many times the individual also suffers. Work is quite often distributed haphazardly among individuals without due regard to their respective capabilities, either plus or minus, engendering frustration and in-

competence rather than pride in work and a sense of achievement. In this area, there has recently there emerged a term, "occupationology," which means "the science or knowledge of men at work." Written office job layouts are big steps forward in occupationology. They promote the welfare of the individual, as such, within business and hence make for efficient office operations.

The development of sound job layouts may seem comparatively simple, but actually it entails a great deal of preparation, planning, and investigation. In the first place who should make this study of clerical effort and who will state what it should cost? The answer to this is the same as the answer to a similar


TASK LIST

NAME TITLE GRADE

NO.	FUNCTION	WHEN PERF.	FREQ	TIME HRS	TIME PER

EXHIBIT 2

question regarding shop labor. In the shop there is a qualified industrial engineer, expert in motion study, to specify the operations. The cost accountant puts a value on these operations. The engineer and the cost accountant work together as a team. For the study of clerical operations and their cost a team is also recommended, to be composed of a qualified engineer, expert in motion study and a cost accountant expert in his field. It must not be expected that the cost accountant, unless he is also an engineer, can do the engineering work in the office any more than he is expected to do it in the shop.

Methods Study Under the Supervisor

However the team approach, considered the best, is by no means the only approach. A consulting engineering company will do the same job on a contract basis or company supervisors can perform the job if given some background. In this paper, the supervisors' approach and the team approach are considered.

The steps necessary to conduct a clerical cost study are:

1. It is most important to explain to the employees that a study is to be made. They should be told what will be done, how it will be done and what the possible results might be. Only by being completely honest and open can the study succeed. Employees appreciate being taken into confidence. They respect honesty and as a result will be highly cooperative.
2. A task list form must be designed. Exhibit 2 shows a typical task list. There are columns for: functions, when performed, frequency, and an estimate of time required to do the job. Each employee is furnished with these forms and is requested to fill them in to the best of his ability with respect to his duties. The purpose of this is to determine each function which exists, to know exactly when it is to be performed, how many times a year it recurs, and approximately how long it takes. The supervisor should check the data for completeness and verify the estimates of time.
3. From the data thus assembled, a preliminary load chart is compiled in the form shown in Exhibit 3. A load chart is a graphic presentation of existing work in a department. The knowledge taken from the task lists of when a job is performed and how much time is expended, gives all the necessary data. In Exhibit 3 the simplest cycle, that of one week, has been depicted. The assumption is that over the course of one week all the functions would have been performed and the load for each of the other weeks of the year would be similar. The chart indicates that four people working seven hours a day are required to do the job and also shows the peak load points. Here should be concentrated efforts to examine procedures in detail.
4. Whenever a procedure is particularly time-consuming and for procedures falling in peak periods, it is usually advantageous to employ a process chart, using standard (American Society of Mechanical Engineers) symbols. Both the principal symbols and a typical chart are present in the two sections of Exhibit 4. In the procedure shown there are three operations, two checks and two transportations. Since operations are productive and other elements are not, any excessive number of nonoperating elements is a danger signal. In the case exemplified, a new procedure was designed under which one operation, one check and one transportation element were eliminated.
5. Examination of equipment layouts is next in order. These too frequently result from evolution rather than planning. In the floor plan shown in Exhibit 5, there are two banks of file cabinets and six people. A simple study will determine which people use the files and how often. This can be accomplished by having each clerk keep a record of every reference made for a period of time. If it is assumed that study indicated that A, C and F were the only people using the cabinets and the frequency of use was 20 times per day per clerk, it might be determined that they walked 150 miles per year at the industrial walking rate of three miles per hour, or 50 hours a year. To improve the arrangement, F was placed where B is shown, C and A were interchanged, and the three desks reversed.

At this point, the supervisor is finished with his study. He should re-evaluate the "should take" time required to do the jobs. He should try to re-schedule jobs contributing to the peak periods. He should redraw the load chart to see whether he can reduce his personnel and costs. He should take the necessary steps to reduce the personnel in his group to the most efficient number.

Team Play

The steps which the supervisor can take to reduce waste effort in the office have been reviewed. If the methods study is directly assigned to a team consisting of an accountant and an engineer, they would begin in the same manner with the task lists and preliminary load chart. They too would process-chart all heavy and complex time-consuming functions. At this point there would be added the time study process for all repetitive functions and all functions contributing to peak loads. Determining volumes of all work loads would be carried out by actually sampling the volumes, using report data, etc. Floor plans would be analyzed in the manner which has been shown. Here another plus to the study shows up in the form of job evaluation in furtherance of an attempt to have the grade of work assigned properly and at minimum cost. From the data obtained a final load chart is worked up.

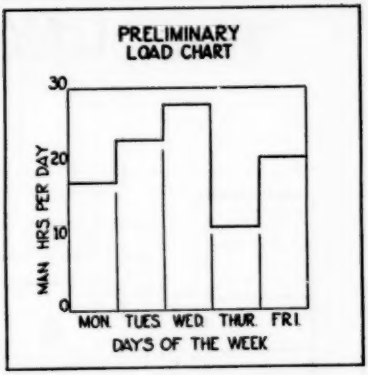


EXHIBIT 3

PROCESS CHARTING

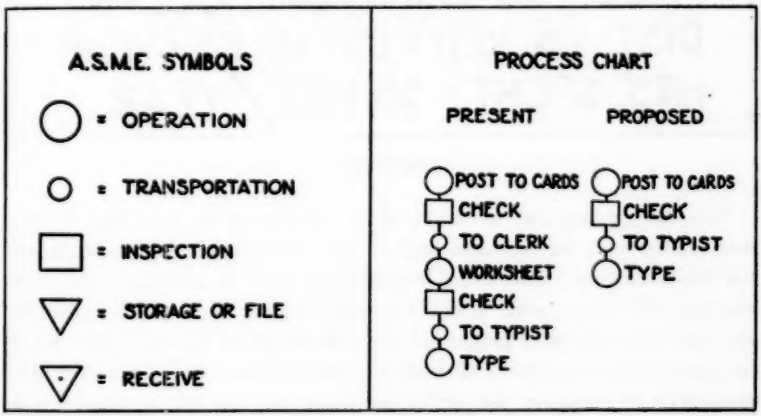


EXHIBIT 4

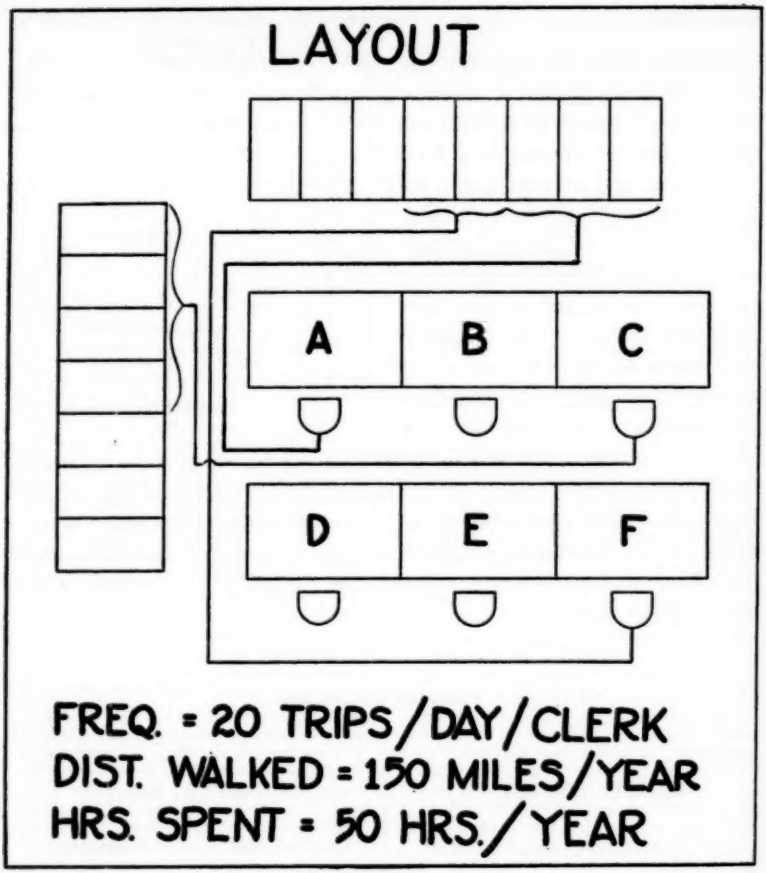


EXHIBIT 5

This chart, exemplified in Exhibit 6, is a picture of the final load showing time-studied load, the estimated load of jobs impracticable to time study, and the allowances which have been determined by study of existing contingencies and personal requirements. It should be observed that the load is spread evenly and that now only three people are required instead of the four called for by the preliminary load chart in Exhibit 3. The reduction came about because of elimination of pacing on the part of the employee. This pacing element is reduced through the use of time study.

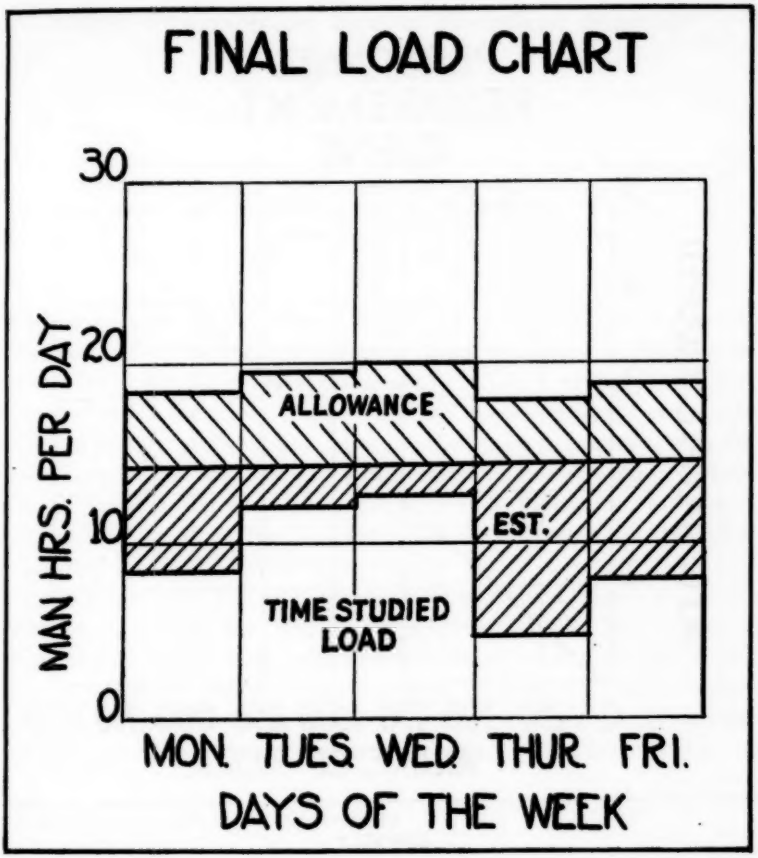


EXHIBIT 6

The team goes through one more step. It makes up a Personnel Requirement Curve, Exhibit 7, to give supervision a yardstick to use to determine the number of people necessary for any given volume. All the work in the department is evaluated in terms of a common denominator of volume and the time required is calculated for various volumes. This chart is very helpful to supervisors and eliminates guesswork in determining personnel requirements as volumes change.

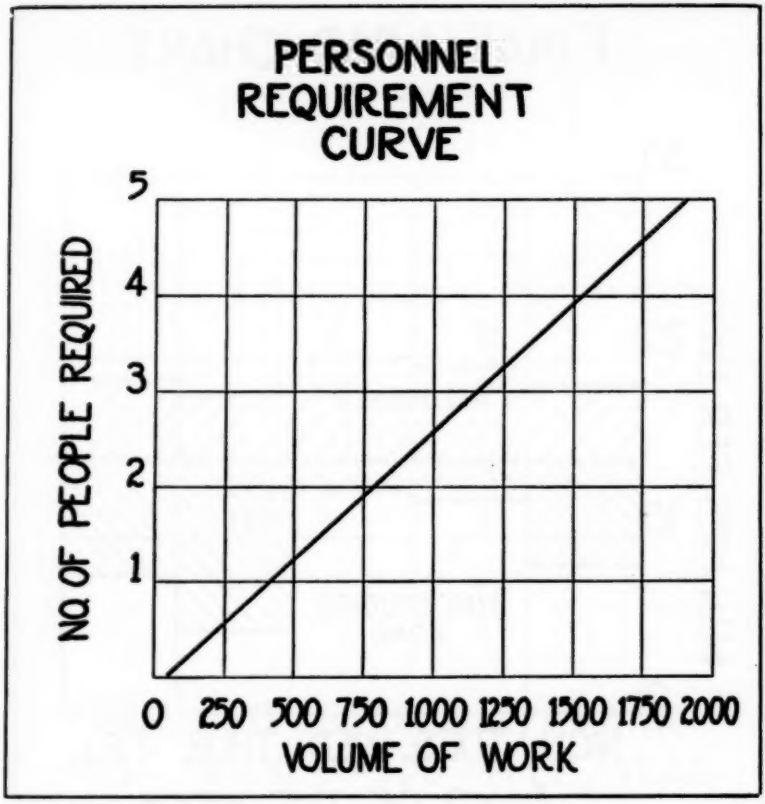


EXHIBIT 7

Conclusion

It has doubtless become apparent from this article that I believe there are both the need and practical avenues of application for much more scientific management in the office and that it is incumbent on industrial accountants to do all that they can to accelerate such application.

However, it must not be forgotten that these things are not accomplished without effort or without cost. Nevertheless, the effort and the accompanying outlay will be on relatively safe ground if the approach is systematic and if it engages the talents of the accountant and the engineer alike.

Good Procedures Are a Practical Matter

by ROBERT BROATCH, JR.

General Accountant, The Bassick Co., Bridgeport, Conn.

The examples introduced in the forepart of this article to illustrate desirable characteristics in those important office sequences known as procedures, are followed by the author's considered comments on five techniques of work simplification through which the results sought are most effectively obtained.

THE MOST COMPELLING SPECIFIC REASON for good procedures is customer service. As an example, the production control department is dependent on accurate and speedy information with respect to receipt of purchased items and parts produced in the plant. The success of *any* business is dependent upon its ability to produce goods or services at attractive prices and quality, with the greatest possible dispatch. The success is dependent upon the coordinated efforts of all departments from the purchasing department on the one hand to the sales department on the other. The coordination and dispatch are, in turn, dependent on smoothly functioning economical procedures.

Likewise dependent on good procedures is the expeditious issuance of accurate statements to management. Without the figures as guidance, management is "flying blind." For instance, bottlenecks in sending receiving reports to the accounts payable department can delay a closing. As a result reports to management may be late. Procedures in their entirety should insure prompt accurate reports to management through the elimination of delays and bottlenecks.

Procedures Are Methods Assemblies

Throughout this article it will be necessary to differentiate a procedure from a method. A procedure may be defined as a series of related clerical steps involving several persons and embracing a complete routine. A method is considered to be the manner in which an individual clerk performs one or more steps of a procedure. Examples of procedures would be making and invoicing shipments to customers and receiving and recording material from vendors. Examples of methods would be the techniques used in extending the customer's invoice copies following shipment or the manner in which receiving reports are prepared in the receiving department. It can be readily seen that a procedure is of a higher order than a method and embraces a number of methods.

However, this does not mean that importance should be placed on procedures

at the expense of methods. The whole is equal to the sum of its parts and the procedure is no better than the methods which it employs. An adequate procedure can be offset by an inadequate method. To take a simple case, we ship several product lines from our plant which must be billed from the executive offices where the billing department is located. In order to maintain an eight-hour billing cycle from the time of shipment of the goods to the mailing of the invoice to our customer, we have to equalize as much as possible the flow of work into the billing department and minimize the interval between shipment and the receipt of the shipping ticket in the billing department. We accomplish this by excellent cooperation of the plant in forwarding the shipping tickets promptly and frequently. Simple—and essential for the proper functioning of our invoicing procedure.

Good Procedures Call for Fixed Responsibilities

A particular procedure should do to a particular job and an assigned staff should operate according to procedure, so that responsibilities can be fixed. Fuzzy delineations of authority result in overlapping responsibilities. Under such conditions it is pretty certain that at sometime the routine will fall down, probably at peak load.

Perhaps a sales correspondent has been in the habit of pricing the orders for a certain important account because of an error made in the past by the pricing clerk. He has thereby assumed a responsibility which properly lies with the pricing clerk. Some urgent outside business suddenly calls him away from the office. Everything goes along fine except for one large order received from this account. The pricing clerk, feeling that the responsibility for pricing this order belongs to the sales correspondent, puts it to one side. On the other hand, the sales correspondent has assumed that the pricing clerk would price all orders. The result is a delay in the entering of this order and, of course, dissatisfaction on the part of the customer. Fundamentally the cause was a blurring of the lines of responsibility.

Again the lack of defined responsibility may be deeply embedded in routine rather than a deviation from practice. Credits to customers were formerly issued in our company by the individual sales correspondents, without any one individual in the sales department being responsible for the overall procedure. The accounts receivable department issued a lengthy list each month of unadjusted deductions from remittances and customers' debit memos not offset by our credits. By pursuing the men in the sales department, we were usually able

to break loose the older items on this list, but there was considerable delay in getting any credit processed.

To correct this situation, one of the assistant sales managers was assigned the responsibility of following the items shown on the list and the preparation of all credits was assigned to a single clerk. From the factory end, a supervisor on the production control department staff (since we have no return goods department, as such) was assigned the responsibility of checking on merchandise sent back to us for one reason or another. Without altering the procedure, we were able to expedite the issuance of credits to customers by assigning specific responsibilities under it.

Recognition of Work Load and Job Assignment Efficiencies

A good procedure should equalize the work flow. Unless work flows at a fairly constant rate to and through each operation, delays and bottlenecks will result. The most important point to ascertain before permanently assigning an operation to a clerk, is whether or not her job is loaded properly after the assignment. This raises the question of what constitutes proper loading. A fairly realistic rule-of-thumb approach to this problem is to allow one hour out of every eight to reserve time, fatigue allowances, and rest periods. In other words, time for the proposed operation plus the time required to perform work already assigned to the individual should not exceed the seven-hour limit. Also, realism in time allowances for each step on an operation will result in realistic loading.

In order to do a good job here, it may be necessary to rely on statistics for similar operations. For example, figures obtained within the organization through simple time reports to determine the realized output for a particular type of work may be assembled. In general accounting, we get a daily report summarizing the volume in each of our departments. We know the number of back orders prepared, invoices mailed to customers, orders received and typed, and vendors' invoices received and entered in accounts payable, etc.

Although these reports are designed for day-to-day control purposes, they are an important source of additional information which may be used in planning job loads. As examples, the number of orders per hour being typed and the number of orders and invoices per hour the duplicator operator can handle, are made available for us. From time to time, we have developed statistics on other phases of our operations. A record of posting time on the accounts receivable posting machine, the time required to stuff the accounts receivable ledgers, the time required to sort out invoices or employee's checks, etc., are items in point.

It is generally desirable to keep the kind and quality of work assigned consistent with that already being performed by the individual. A typing operation should be assigned to a typist wherever possible and not to a posting clerk who does not regularly type. A hand posting operation should not be assigned to a billing machine operator. In addition to helping smooth work loads this also avoids having a more highly paid skilled operator do a job which a lower paid clerk should handle. It also simplifies considerably the problem of training replacement personnel and carries through the principle of the division of labor to obtain the benefits of specialization.

Selective Relaxation of Procedural Controls

Although a procedure should facilitate accounting control, it is often possible to save substantial amounts by reviewing existing procedures to see if it is not possible to relax on some controls. Recently, we eliminated our order register without any appreciable minimization of control. The register was used merely to record incoming orders and to assign our order numbers to customer's orders. Inasmuch as we had never maintained in the order department a detailed record of shipments against each order, the whole operation was needless. This elimination saved us a couple of hours of clerical time daily.

Another change in procedure of the same general type with respect to the system of controls, which we made in our procedures, was in connection with processing customers' orders. Small orders had always been a thorn in our side, but there seemed to be no really effective way that we could avoid them and still service our customers properly. We produce literally thousands of different casters for use on anything that rolls, from a baby's bassinette to a B-50 bomber. Most of these are sold through a relatively small number of equipment manufacturers. Thus, in this segment of our business we enjoy large volume.

On the other hand, after these products are sold to the public or to industry, they have to be serviced, and this is largely accomplished through distributors and dealers. Because of the great number of items sold, it is impossible for these outlets to maintain stock of every item which may have to be serviced or replaced. Consequently, a large share of the responsibility of handling this business falls back on us, as the manufacturer, in the guise of small orders.

We did not appreciate the scope of the problem until we made a check by random sampling of our shipments. We found that over twenty-five per cent of our incoming orders were for less than ten dollars and accounted for less than one per cent of our total dollar volume. Yet we went through the same motions in getting the goods shipped and invoiced whether an order was for $5

or $5,000. It came to seem obvious that less control was required for smaller orders, and we proceeded accordingly. We developed a wheel-within-a-wheel procedure that cleared these orders through the same channels without the necessity of creating a separate small order department and eliminated over half of the steps involved in our regular procedure. This was accomplished by recognizing that orders of a particular type, if segregated at the outset, could be short-circuited through the whole organization. We have estimated that we are saving over $7,500 annually in salaries, stationery and postage because of this procedure.

There Are Times to Add to Paper Work

Because clerical labor is roughly proportionate to papers handled, as a general rule, it is desirable to reduce the number of pieces of paper which are handled or filed, but there are occasions when it is smart to add paper if it will eliminate bottlenecks. A good example of this occurred recently in connection with the processing of freight bills on our incoming shipments. (The responsibility of processing freight bills resides with the accounting department. The factory felt that, if the function were handled by the traffic department, this would place an added burden on an already over-burdened unit.)

Under the previous procedure, the accounts payable copy of the "receiver" was used to pass the vendor's invoice for payment and, in addition, was stamped "transportation paid" when the related transportation bill was checked and approved. We have considerably increased the work-flow through the bill passer by providing an extra copy of the "receiver" which is used solely for passing freight bills. We obtained the required control with substantially less effort than otherwise by the simple process of adding an extra copy to the form.

The reason can be made clear quite easily. The vendor's invoice and the carrier's bill did not arrive at the same moment. The "receiver" was attached to the vendor's invoice, which might be out of its place in file when the clerk needed it to process the freight bill. He would then have to search in any one of a half dozen spots where the vendor's invoice and the "receiver" might be, e.g., attached to a voucher awaiting payment, filed with the paid bills, in a group of invoices being approved for payment, and so on. Difficulty in locating the invoice was made particularly troublesome because of the rigid time limits imposed by the Interstate Commerce Commission for payment of carrier's bills. Often we would have to pay the freight bill before it could be checked to the "receiver". Hence the solution, stated above, of an additional copy of the "receiver".

Others Have Solved Similar Problems

Industrial accountants—or others—faced with the problem of developing new procedures or changing existing ones to meet new conditions, have to rely to a large degree on their individual qualifications for the task. Visits for exchange of information should definitely have a place on the agenda of industrial accountants responsible for procedures.

It is also important to keep posted on current developments in the office equipment and forms field and not to shut the door on the salesman. He can be your best friend. He is faced with relevant problems daily and usually has had considerable experience in solving them.

Nor is it in the least amiss to review trade and association publications.

A further source of help and a very real one is the acumen of subordinates. Suggestions are to be encouraged from all. They will help the individual, the department, and the company.

Tools for Rebuilding Procedures

Up to this point the present article has covered, in succession, a number of the characteristics of good procedures and effective procedures work. The presentation has chiefly been by example. We are now far enough into the subject to recognize its practical nature and are prepared to discuss its broad fundamentals without getting lost in the wilderness of theory. These fundamentals are analyses and syntheses, through which procedures are taken apart and rebuilt more suitably to their purposes. The process involves thinking which is no more abstruse than that employed in tinkering with a new power lawn mower, attempting to fix the cellar door, or wall papering the nursery. Applied to office routines, the process has been termed "work simplification", a designation which described to a "T" its appropriate objectives.

After determination of the goal of the procedure, which gives the broad outlines of the ultimate synthesis, analysis takes over through definition and listing of each step in sequence, with time allowances whenever practicable. After the steps are properly set forth, each must be critically reviewed, always with possible duplications in mind. The following questions, which are intended to bear on the time-consuming operations, are angled to determine the necessity and importanc of individual steps:

1. What is being done, in what detail, and for what purpose?
2. Where is the detail being done?
3. Why should it be done there?
4. When is the detail currently done and when is the best time to do it, considering other detail work with which it might be combined?
5. Who does the detail at present and who should do it?
6. How is the detail performed and how can it be made easier to do?

If the above questions are asked, and painstakingly answered, they will develop a point of view which considers the good of the company rather than any one division or department. They will induce thinking toward the elimination of unnecessary work and the development of the best type of operator and equipment.

More specifically, however, as analysis proceeds, it is possible to make use of a "kit" of work simplification tools, in the form of techniques now pretty well known. They are aids to—not substitutes for—the labor of analysis and subsequent synthesis. The principal ones are:

1. Output measurement.
2. Process charting.
3. Process layout preparation.
4. Forms analysis.
5. Motion analysis.

Output Measurement

One of the most important tools of work simplification is output measurement. Many are the times that a method improvement has been made and has failed in operation simply because there was no yardstick by which to demonstrate improvement. No definite or permanent advance is ever made—whether with materials, men, or paper forms—until use is made of measurement.

The first step, therefore, in the application of work simplification to any major office routine, is to determine the present output per man-hour. If the information relating to units and hours necessary for the determination of this factor is not available, it can be obtained while the remainder of the methods analysis is being made. In obtaining it three important things are accomplished. These are:

1. An opportunity for determining the number of hours spent each week on the clerical routine concerned—and hence the broad limits of potential savings. (All other things being equal, it stands to reason that the larger the number of personnel involved, the greater the opportunity for improvement in an operation.)
2. A yardstick against which improvements can be measured as job methods are changed through the application of work simplifications.
3. A basis for evaluating supervisory performance in maintaining increased output after the new method has been installed.

Process Chart

Probably the most important tool available to anyone attempting to apply work simplification to an office routine is the process chart. It is used as an instrument to provide a detailed job break-down in chart form. Quite often it is

difficult for anyone who is close to an operation to see it in the same way that it appears to an outsider. That is why a total stranger to an operation can often ask a question or make a suggestion which may result in definite improvements. In many instances this is because he sees it in a "birds-eye view," whereas the man on the job may have been looking at one or a few details.

The process chart is a graphic representation of the sequence of events in any process or procedure and can be set up to include information considered desirable for analysis, such as time required and distance moved. It is of great value in presenting information in condensed form and in making it possible to visualize an entire series of operations of a procedure in a manner not possible by any other method.

In this connection, the work done in any process can be divided into four types of classifications: operation, transportation, inspection, and storage. For the preparation of a process chart, each type of work is designated by a symbol. The four common symbols and their respective definitions are:

1. Operation — When something is being changed or created or added to, a large circle is used to show that an action or "operation" is taking place, e.g., typing a letter, filling out a form, etc.
2. Transportation — When something is moved from one place to another, a small circle is used, e.g., an order carried to another desk, etc.
3. Storage — When something remains in one place awaiting action a triangle is used, e.g., a letter in an "outgoing box", a letter in file, etc.
4. Inspection—When something is checked or verified but not changed, a square is used, e.g., proofreading a letter, checking a time card, etc.

The process chart shows the route of the object being followed from the very beginning of the process to the end. With the use of the four symbols, it is possible to indicate on the chart what happened at each step in the process. Any work can be completely described, no matter what it is. In making up a process chart on either an object or a person, care should be taken not to confuse the object being followed. This is probably the most common fault in process chart making. For instance, if a clerk is carrying a paper, puts it down, and goes to look for a file and we are following the actions of the clerk we do not use a storage symbol. The paper may be in storage but the clerk is not.

The use of the process chart inevitably broadens the job study. Instead of making change in the detail of a process merely because that detail may be the easiest to change or is the one offering the greatest opportunity for improvement, process charting permits consideration of all details involved in the procedure being studied. Unless these are all considered, the changes made may yield only a part of the benefits which might be secured. Moreover, the changes may not be for the best interests of the operation as a whole.

Process Layout

Another very useful tool in the application of work simplification to an office routine is the process layout, particularly when it is used in conjunction with a process chart. A process layout is simply a layout of the area involved, on which there has been indicated by a line the flow of the item which is being followed on the process chart.

The layout provides additional help in visualizing the process and is particularly valuable in high-lighting poor utilization of floor space and poor flow of work. It need be nothing more than a rough pencil sketch of the portion of the office in which the process occurs. However, if a number of operations are involved and considerable floor space is occupied, the process layout will be of considerably more value if drawn to scale. Like a process chart it is merely the reduction of a sequence of operations to a still picture which can be analyzed for improvement of existing methods.

As with the use of a process chart, it will be found desirable to make a layout of the improved method. Here again, a questioning attitude must be maintained in the course of the work. The most important considerations is to keep the transport distances to a minimum and the work flowing, so far as is possible, in a straight line. If practicable, the office desks should be arranged so that the papers handled can be transferred from one clerk to another without involving a transport by walking.

The following are a few important factors to keep in mind when making a layout of an office area:

1. Where possible, a minimum of 50 square feet of floor space should be allocated for each employee.
2. Cross aisles should be at least 3 feet in width and main aisles should be 4 feet (preferably 5 feet) in width.
3. Desks should be arranged so that they are all facing in the same direction, in order to keep employee conversation and disturbances to a minimum.
4. Desks near windows should be positioned so that the light will fall unobstructedly on the work.
5. A minimum of 20 foot candles of light at desk level should be provided all employees.
6. File cabinets should be centralized in one section of the office area. This will not only provide a savings in floor space but in reference and filing time as well.

Forms Analysis

An opportunity for saving which is often overlooked in a methods improvement of an office routine is that which can be obtained from an analysis of the paper forms which are used. Forms may be considered as tools used by the office to get things done. Properly planned, they convey information quickly

and clearly, simplify work, reduce mistakes and fix responsibility. In analyzing a form to determine whether or not it is serving its function in the best possible manner, five questions somewhat similar to those cited earlier in connection with procedure inquiry as a whole, are serviceable:

1. What is purpose of the form?
2. Where should it be made out?
3. When should it be made out?
4. Who should make it out?
5. How should it be made out?

If a form has been analyzed and found to be necessary, the next step should be to see if it can be combined with some other form. If not, the form should be drawn up so as to keep the amount of information (and thereby the time required to fill it out) to a minimum. Where possible, the form should be so set up that the information which must be filled in can be entered in straight top to bottom sequence.

The size selected for a new or revised form should be checked against a table of standard form sizes, so that the cost of paper may be kept down. However, it should not be forgotten that a form, as to purchase cost, is probably the most economical tool that employees work with. The average form costs only a few pennies, compared with the dollars it takes to prepare and use it. Hence, enthusiasm for economy in printing should not be allowed to overrule economy of operation.

Motion Analysis

Thus far consideration has been given to the tools and techniques of overall methods study. The last step in the application of work simplification to office routines is the improvement of the individual's work place. This can be done through an analysis of the present work methods followed by an operator and the application of the principles of motion economy to them.

Since most clerical operations are performed by hand, these motions only will be dealt with. Some of the types of hand motions are as follows:

1. Finger motions.
2. Motions involving fingers and wrist.
3. Motions involving fingers, wrist and forearm.
4. Motions involving fingers, wrist, forearm and upperarm.
5. Motions involving fingers, wrist, forearm, upperarm and body.

These general classifications are given in progressive order, the first class requiring the least time and effort. As one goes down the list, the motions take more time, involve more fatigue, and are less accurate. It is fundamental,

therefore, that motion should be confined to the least arduous classification with which it is possible to perform the work properly. The following general rules, applied to any job, will assist in reducing motions to the appropriate classifications.

1. Office equipment, forms and supplies should be located around the work place as close in front of the operator as possible. Very frequently the operator's desk is laid out with the work tools, forms, and supplies in a straight line. This can be improved, for a person naturally works in areas bounded by lines which are arcs.
2. The use of a simple fixture, bracket or holding device will often free a hand so that it may proceed with other constructive work.
3. All writing instruments, etc. should be pre-positioned whenever possible.
4. Motions of arms should be in opposite and symmetrical directions instead of in the same direction, when this is practicable of attainment, and should be made simultaneously.

If the above general rules for motion economy are applied, there is bound to be some improvement in the job being studied. Not only should it reduce the amount of work that has to be performed by a clerical worker, but at the same time it should make the work which remains easier to accomplish.

Summation

In this article, the terms, "procedure' 'and "method", were first identified. This opening was followed by general and case material on selected features of procedures work. It was noted that fixed responsibility, even work loads, proportioned controls, adequate paper media, workable compromises among possible advantages, and the properly adapted experiences of others, all characterize good procedures. Attention was then directed, in the last half of the paper, to five tools of effective procedures analysis and synthesis.

The objective has been to offer aid in visualizing procedures, so that present shortcomings may be discerned and better procedures constructed. A procedure that seemed the "last word" only a year ago may be seriously defective today. A procedure has to be reviewed critically from time to time to guarantee its continued success with changing conditions. Visualizing the procedure is important, but first you must visualize the problem.

Conference Method To Formulate Procedures

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The viewpoint given expression to in the present article is that the detail of procedures proposals, their acceptance as revised routines, and their operation as methods improvements, all benefit from participation by supervisory personnel in the revision process. The conference method which naturally results, it is pointed out, has especial pertinence to small and medium-sized companies.

IT IS A PRIMARY RESPONSIBILITY OF every chief accounting officer to see that accounting methods and procedures are devised in such a way as to assume economical and efficient performance.

The approach to the problem must be along practical lines. For example, an accounting department consisting of four or five employees would certainly not warrant the hiring of a full-time procedures supervisor. In such a situation, the department head would have to assume the role of procedures supervisor and would devote such a percentage of his time to this work as would be suitable in the light of the circumstances.

There are probably as many different ways of going about work simplification as there are individuals engaged in it. Perhaps the strongest single asset which a procedures supervisor may possess is a reputation for always carefully thinking through a new idea to a logical conclusion and for not attempting to sell an idea which later must be revised substantially or discarded. One may say, of course, that this regard for reputation would apply only to the procedures man who has a professional standing to maintain, but it is surprising how quickly it comes to be known around an office that a fellow has sound and practical ideas, if only on the basis of a single successful procedure installation.

Another indispensable characteristic of the procedures supervisor is an open-minded attitude. This attitude should be apparent to those about him at all times. People naturally look disapprovingly upon the individual who exudes a know-it-all air, and a procedures supervisor possessing this characteristic cannot achieve a full measure of success. It is essential to consider the suggestions of those who will be affected by the new method of procedure, whether supervisor or rank-and-file employee, and to accept those suggestions which are worthy and bestow credit as it may be due.

On the average, there is stronger opposition to new ideas on the part of the older and more experienced employees than from the beginners. Also, there

may be more resistance from supervisors than from the rank-and-file employees. This has at least one favorable aspect. An appraising attitude on the part of employees with longer service and greater experience will probably result in improvement and refinement of any new method or procedure which is being installed. A less favorable aspect of the matter is that aversion to change is often more pronounced in the older employees simply because established ways have become more ingrained upon them.

Procedures Work Has a Natural Place in all Companies

A regular established plan for the improvement of methods and procedures need not be beyond the reach of smaller organizations. We do not have a procedures department in our company. This used to make me a little uneasy, perhaps because of an inner feeling that we were "missing the boat" on procedures, but I have since reached the conclusion that my fears were unfounded. As with us, the function of such a department does actually exist, although intermittently perhaps, in every office. There is always someone—whether the comptroller, the general manager, the chief accountant or office manager—who is making sure that existing methods and procedures are being properly executed and is looking out for ways to make improvements.

While the organization for procedures work in our company is informal, much progress has, nevertheless, been achieved. For somewhat more than a decade, I have been privileged to have a major part in numerous projects involving the creation or revision of procedures. Some representative projects have been the installation of a standard cost system for a manufacturing unit, revision of existing forms to improve their usefulness and speed their preparation, improvement of closing procedures, revision of sales branch record procedures (including the writing of a complete manual covering sales branch operations), improvement of home office accounting procedures covering payrolls, cost accounting, etc.

Conference Method an Adaptable Procedures Technique

No matter what type of procedures organization is chosen, the techniques of procedures work are basically similar. For example, the work flow chart is a rather common tool in creating or revising office procedures. There is also the procedure write-up which is circulated among those individuals who must operate the procedure, such write-up being a means of delineating the various operations to be performed. Furthermore, there is the somewhat more specialized

technique, peculiar perhaps to the larger and more highly developed organizations, of subjecting individual operations to intensive time study and methods analysis. A more widely serviceable technique, the conference method of procedure development, while admittedly not a solution to all problems in this field, can be used advantageously in many procedure installations. The conference method relies largely on those who will later operate the procedure, for direct aid in formulating it. The individuals asked to give assistance in this manner are, in most instances, division supervisors but occasionally perhaps a specialist in a particular line, although not a supervisor, might be called upon to participate because of his superior knowledge of a particular subject. The conference leader is properly a member of the comptroller's staff and serves as both spark-plug and moderator for the group.

As might be expected, the membership of the conference depends upon the procedure being discussed. It may be mentioned also that a conference is convened only when there is a definite procedure to be considered. This may well be an important point. A procedures supervisor or department definitely assigned to the work may, occasionally at least, reach a point where there is no new project to tackle and turn to the revision of existing procedures which may not be particularly in need of revision.

The conference method affords an opportunity for the individual division supervisiors to have a voice in the formulation of a new procedure thus eliminating in advance some of the natural resistance to new ideas. Furthermore, in the course of the conferences, the individual supervisors are educated to the new procedure, with the result that the training of the rank-and-file employees under them can begin immediately after the details of the procedure have been worked out.

Moreover, by bringing supervisors together in procedures conferences, there can be arranged an amicable distribution of the work load. Anyone with office experience is familiar with the supervisor who is inclined to shoulder off on other departments a portion of the work which would more logically be assigned to his own. Familiar also, but a bit more rare, is the ambitious supervisor who is always willing to take on one more job, whether or not it is properly within his province. The conference leader must be cognizant of these types and so direct the conference proceedings that the work load will be logically apportioned among the various departments involved, to assure a minimum of realignment following installation of the procedure. Points of friction usually arise because of conflicting personality types and open discussion of mutual problems is a good way to resolve such differences.

An Example of the Use of the Conference Method

By way of illustrating the conference technique of procedures development, it may serve to describe the processing of a payroll system currently being installed at one of our factories. For years we have used tabulating cards for our factory payrolls and, in addition to the payroll itself, we obtain numerous labor analyses and distributions from these cards. The new system is also dependent upon tabulating cards and equipment but incorporates pre-punching. This involves automatically punching, by means of a reproducer and a set of master cards, a large percentage of the information heretofore handwritten on the cards and then manually key punched.

The conference method begins to function only after a new idea has been conceived. In this case, I do not recall the exact circumstances which brought to us the idea of a pre-punched payroll card. To be sure, the idea of pre-punching, in itself, is not new to those who are familiar with tabulating machine methods.

After obtaining the "green light" from top authority, we proceeded to work out a complete system through a series of conferences of the department supervisors involved. Those participating in these conferences were the supervisors of tabulating, timekeeping, cost accounting and payroll computing. Aside from the technical difficulties which had to be overcome, there was required a drastic realignment of the operations being performed under the old system. This realignment of the work load has involved many of the problems of human relationship usually associated with procedures work.

At the outset, of course, it was necessary for the conference leader to describe the idea to the group and, in so doing, a certain amount of salesmanship was required. However, the conference leader had discussed the matter thoroughly with his superiors and all were agreed that the new system was sound in principle and should be installed as soon as possible. A statement of this concurrence among those in higher authority proved to be an ideal way for the conference leader to start the discussions.

The changes wrought in our departmental procedures as a result of converting from a manually punched to an automatically pre-punched payroll were very marked and yet such changes were effected with a minimum of friction and lost motion. For example, in the timekeeping department it was necessary for the supervisor, who had been a conference participant, to instruct the individual timekeepers as to what would be required of them under the new system. Because he had had a direct part in the formulation of the system and, hence, was thoroughly familiar with every new procedural detail in timekeeping as

well as in the other departments, this supervisor was in a position to instruct effectively. Such first hand knowledge was a real benefit not only to the timekeeping supervisor but to all other supervisors when it came to teaching the rank-and-file employees in their respective departments.

In the case of the timekeeping department, the general effect of the new system was to simplify existing procedures by reducing the number of items to be written on time cards, yet the change has not gone so far as to affect the size of staff. Therefore, as would be expected, the new system has met little resistance from members of this department.

On the other hand, the payroll computing department, which performs several important operations on the factory payroll, has been more drastically affected. Under the old system, the time cards were received in this department directly from the factory and the first operation performed was to check the piece rates which had been recorded by the timekeepers and the second was to write the applicable standard costs on all productive labor cards. These two operations have been eliminated under the new system due to the automatic pre-punching of this information on time cards in the tabulating department. The elimination of these operations will eventually also eliminate two clerks from the payroll computing department.

This brings up the rather perplexing problem of jobs which will be eliminated as a result of greater efficiency through an improved procedure. When it is evident to the rank-and-file that there will be a saving of time and, hence, a reduction in the number of jobs, it is only natural for someone to raise the question of possible lay-offs. Such fears may be dispelled with comparative ease by explaining that no one will be laid off because of the change but that any necessary reduction in the work force will occur through the normal turnover of employees. In other words, as individuals in the department terminate their employment for one reason or another, they will not be replaced until the excess in manpower has been eliminated. The fairness of this solution is ordinarily not questioned.

The Conference Serves as a Forum

As to the more general aspects of the conference method, there are advantages which this technique offers besides those which have been mentioned so far. For one, the discussions which take place in procedure conferences serve to acquaint each conference member with at least some of the special problems confronted by other departments in their daily work. This clearer understanding of the other fellow's problem produces a smoother working team, not only with

reference to the new procedure being developed but in all day-to-day relationships between the departments.

Moreover, a particular supervisor may have a reasonable objection to a certain procedural change but there has not been the proper stimulus to cause him to express his views to others. The conference method is the ideal way to encourage a department supervisor to speak out in support of his views on a particular point. If his reasons prove to be sound, they will undoubtedly be accepted by the group. On the other hand, if his reasons are weak or his complaint wholly unfounded, he will be forced to give ground in the face of logical arguments. In this case, if the individual is fair-minded, he will probably confess to having given only superficial consideration to the matter.

Suggestion System or Not?

That vital part of procedures work which relates to the presentation of new ideas, has certain interesting aspects, especially in pointing up the need to tap the resources represented by the viewpoints of individual workers. Methods of so doing are certainly first cousin to the conference procedure described above. There is a natural aversion to change on the part of most individuals. A change may be fundamentally good but it may arouse opposition simply because it calls for a re-routing of effort along new paths (even though basically there may be only slight departure from former ways).

Furthermore, a change which has been suggested by an observer may be taken as an implied criticism. When, after long practice, a worker had become accustomed to performing an operation in a certain way, he is likely to regard that method as the right method and the only method. This mental attitude toward daily work may exist without the individual being aware that he possesses it. However, if the worker, himself, can be led to create the new idea, there will be an absence of this resistance, in addition to other potential gains.

Immediately there comes to mind the formal suggestion systems operated in many companies today through which the originator of a usable idea receives some direct award. We do not have a plan of this sort and I am not familiar with the usual details. Such an arrangement would seem to have merit but there is a broad area for disagreement between employer and employee when an attempt is made to establish the relative worth of an idea. The question which concerns me is whether or not the employee will always be convinced that he has been suitably rewarded for his idea. If he is not, the suggestion system may create dissatisfaction.

Perhaps it is sufficient that an employee be encouraged to suggest changes in the knowledge that he is contributing to the improvement of office efficiency and benefitting himself by demonstrating creative abilities which will surely be recognized by his superiors. It is my experience that a majority of individuals have the capacity to suggest constructive workable ideas. I do not believe that an immediate monetary reward for every new idea is a necessity. I have in mind that the office with no formal suggestion system should search around for a proper alternative technique of prevailing upon the rank-and-file employees to suggest ideas for procedural improvement. Every supervisor should make it a regular talking point that perfection is never quite attainable and that there should be a continuous effort to improve procedures.

Written Descriptions and Follow-Ups to Make Procedures Stick

Needless to say, neither the rank-and-file employees nor even the department supervisors can be depended upon to produce all new methods and procedures. As stated at the start, real achievement in procedures work requires that someone in the organization accept it as a responsibility, even if a part-time or intermittent one. The mere need to call conferences into session makes this clear.

A further need for centering this responsibility in one individual is that all new procedures should be reduced to writing, no matter who originates the subject matter. Outline form, coupled with a laconic writing style, should be used to conserve the reader's time and facilitate grasp of the content. Furthermore, simplicity is an important quality to be striven for. Big words and long sentences are to be avoided, but the exact word for the thought to be expressed is an objective to be painstakingly sought. In the case of the more complex procedures, involving operations in several departments, it is always desirable to circulate a rough draft. Such a tentative formulation may disclose errors and bring to the surface points of disagreement which should be resolved if the procedure is to work properly. Moreover, a review of the procedure after it has been committed to writing may stimulate thought which will result in further improvements.

After the final draft has been issued and the wheels of the new procedure have begun to turn, attention cannot be withdrawn completely, because there is the inevitable breaking-in process, as with a piece of mechanical equipment. While the procedure is still young, there is need of periodic review to determine whether all are performing the operations as prescribed and also to be watchful for a point at which a minor change might eliminate a trouble spot not foreseen.

This following-up subsequent to installation is a very essential element of the work.

For example, it will now and then be found that operations supposed to change have somehow continued in the old channels. Failure to comply with the new procedure can be due to any one of several causes. Perhaps it was honest misunderstanding on the worker's part. Perhaps he read the procedure carelessly or not at all. Or he may cling to the former method out of sheer stubbornness. At any rate, there are at least two lessons which can be learned from such an occurrence. First, it should serve to emphasize the importance of a clear and simple style in procedure writing and, second, it should teach that the period of following-up the new procedure should last until there is some assurance that each step is being performed in the prescribed manner.

Many Procedures Make a Manual

As procedures are written and placed in operation, the text matter can be put to accessory use as a means of instructing new employees. Over a period of time such written texts may be brought together to form a manual of office procedures. A practical idea is to reproduce individual procedures on punched paper for filing in ring binders and to furnish department supervisors with copies of all procedures written. Some who receive the full set may not be directly concerned with every one but will be encouraged to develop a broader outlook.

The accounting manual covering all branch office procedures for our seventy-four sales offices may serve as an example. This manual helps immeasurably to bridge the distance between home office and branch and furnishes, to a degree, the supervisory influence which could otherwise exist only through personal association as in single-office establishments. The manual simplifies instructional correspondence by the home office because a subject can often be covered by merely directing attention to a particular page or paragraph. The manual also insures uniform treatment of individual cases in such correspondence and this is significant, as individual letters written on a particular subject would tend to vary slightly in content from one instance to another.

In writing the manual, advantage was taken of all instructional bulletins and memoranda then in effect. The work represented the collective effort of persons individually qualified to handle particular subjects. The drafts which were submitted by these experts were subjected to editorial revision to insure a uniform writing style and a proper clarity of detail. When editing the work, we stressed accuracy and a clear simple style particularly because many who were

to use the manual had only brief business experience and might have the further disadvantage of being new in the company.

When completed the manual consisted of approximately 250 pages of text matter which ran the gamut of subjects from Invoicing to Retention and Disposal of Old Records.

It is essential that the contents of a manual should be properly organized and indexed in order to facilitate reference. We divided the material under approximately twenty-five chapter headings, such headings being in each instance terms which would at once be readily understood and would properly label the chapter content. Individual chapters were broken up into sections and each such section had a concisely worded title to describe its contents.

Chapter titles were listed in the index at the front of the book but section titles were not so listed. It was our intent that the reader should first locate the chapter title with which he was immediately concerned and then, turning to the chapter, scan the section titles to locate the desired details. However, we did go another step with the indexing. Knowing that, in most cases in which reference to the manual would be made, there would be a particular form involved, we included an index of forms at the front which showed both form number and name and all page numbers in the text where information could be found about it.

Summing Up

In this article, there have been several main points. In the first place, it has been indicated that procedures work has a natural place in company operation and calls for the assignment of someone within the organization to conduct it as a responsibility, possibly in conjunction with other duties. As a central technique serviceable in smaller companies particularly, the convocation and conduct of procedures conferences has been given general description.

However, the conference device is not complete in itself. It could be called a "mixing" operation. Hence the need for follow-up procedures, for written descriptions, and for the compilation of manuals. So supplemented, the conference method of procedures formulation may well result in exceptionally good teamwork within a company.

A Group Incentive Plan for the Office

by OLIVER R. ALTUM

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Carrying through to computation of group efficiency rating and individual gross pay, this article first deals with the eligibility provisions and operation coverage of the plan described. Introductory material advances the benefits of group as compared with individual incentives for clerical operations.

THIS ARTICLE IS DEVOTED to description of a group incentive plan for the office, now in use by the accounting division of a large manufacturing concern. It is aimed at productivity measurement and control. The practicability of the plan may vary somewhat according to the size of an organization. Moreover, while productivity measurement and control are just as important in the accounting department as in the factory department, it must be recognized that application depends upon the extent to which the accounting efforts can be standardized and reduced to routine. In large offices where there is a high degree of specialized labor, productivity measurement and control are more feasible than in small offices where they must be obtained largely through observation. However, in offices of all sizes, work simplification is a vital matter.

Incentives can be either group or individual, whether in the office or the factory. The best way to understand and appraise an incentive plan is to see how it fits into the company's general philosophy with respect to management's relationship to its employees. In the company the experience of which is reflected here, this philosophy may be summarized in terms of the following goals:

1. **The opportunity of the employee to develop his or her abilities to the fullest extent.**
2. **Creating of good will among employees within natural groups, thereby bettering working conditions.**

Why Group Incentives?

It is not simply that a group incentive plan results in production of additional or better quality units of work. It also makes the employee realize that the overall scheme of things under which operations are carried on holds something for him as well as for the company. The improved attitude toward increased production and better quality of output which results from the proper use of group incentives distinguishes one business from another in a way which can be sensed upon entering the office.

It is not only production volume and morale which benefit. Office management benefits, too, largely through introduction of productivity measurement in the accounting operations. This makes possible a more accurate appraisal of the value of the workers in the group and more reliable bases for considering individuals for retention, future advancement, and wage adjustments. Performance under group incentives may also be used to measure departmental efficiency and to provide basic data for work simplification.

But why *group* incentives? Are not individual incentives also available and more revealing? The why of a considered preference for group incentives should be apparent from the following points:

1. Variation in the work load in the office is not, in most instances, within the control of the individual operator. Levelling of such loads is essentially a group technique, inasmuch as it is essential, in order to effectively utilize the personnel, to transfer individuals from one activity to another in order to take care of the work load peaks and valleys as they travel through the department. Individual incentives tend to rigidify individual functions.
2. Somewhat similarly, it can be pointed out that the office sums up to a group job, with mutual help a large factor in efficiency. The activities necessary within any office to accomplish the job for which it is established are ordinarily very much diversified, yet related and interdependent. Therefore, the activity of the office can be more effectively handled on a group or team basis.
3. Small changes and variations in work can materially affect individual efficiencies, whereas they will not appreciably affect the efficiency of a group.
4. To obtain the count of work performed on an individual basis is, at best, cumbersome and unwieldly as applied to the office. Tabulation of units of work completed on a group basis is much more easily done.
5. In addition to the difficulties of production count, the translation of an office worker's production into efficiency rating presents special difficulties not encountered to the same degree if such workers are grouped.
6. Individuals working within an office should have but one purpose in mind. This purpose should be to assist in accomplishing the basic function of the office rather than to maximize specialized output, an objective more appropriate to the factory. If this is true, then it follows that the measurement of the effectiveness of the employees, even as individuals, should be based upon how well they perform the function of the office as members of a group.

Eligibility and Operation Coverage

The group incentive plan with which we are concerned here may be effectively illustrated through description of its application to a single department, the Disbursement Department. All bi-weekly period and monthly payroll employees who are permanently assigned to the following jobs in the department were made eligible to participate:

Accounts receivable cashier.
Group leader, payroll clerks.
MSR salary and social security clerk.
Petty cash cashier.
Tax and retirement data clerk.
Assistant group leader, payroll clerks.
Group leader, accounts payable.
Accounts payable accountant.
Secretary, manager.
Stenographer.

MSR expense clerk.
Addressograph operator.
Payroll posting machine operators.
Posting machine operators (accounts payable).
Utility clerk.

The operations covered by the plan include:

1. All routine operations necessary to fulfill the requirements of the jobs listed above.
2. All correspondence, telephone conversations, reports, surveys, interruptions, unavoidable delays, or any miscellaneous operations necessary to effectively carry out the duties of the disbursement department.

Development of Group Efficiency Percentage

Inasmuch as all sections of the department were combined into one operating group, computation of a single per cent of efficiency was provided for to reflect the effectiveness at which all members of the group operate.

The per cent of efficiency of the group is determined by the effectiveness with which the group performs the above and related operations. A time study observer from the methods and standards department reviewed the basic operations in the disbursements department by observations and conversation with the department manager and supervisors in the group. From standard data and time studies, allowances were established for all operations performed by the group. These standard time allowances are as follows:

UNIT OF MEASUREMENT	STANDARD
Accounts payable checks	4.32 min./check
MSR expense checks	3.24 min./check
MSR salary checks	2.60 min./check
Bi-weekly and monthly period payroll checks	3.45 min./check
Supplier's invoices	2.33 min./invoice
Daily constant	3307.0 min./day

The standard productive minutes developed by the group are determined by multiplying the number of units of work completed during the pay period by the standard time allowances. Actual minutes worked by the group per day period (this excludes vacations, absences "paid or not paid," and transfers) are divided into the standard minutes developed by the group. The result indicates the per cent of efficiency at which the group is operating.

The form presented in Exhibit 1 is used for the reporting of work completed for each day. The amounts are filled in and verified by the individual authorized to sign the report. The daily reports are accumulated for the pay period and the total number of units for the period are tabulated at the close. As an example of how the group per cent of efficiency is computed in a specific in-

DAILY BONUS REPORT

Methods and Standards Department

Re: DAILY BONUS REPORT for Operations performed on _____ (Date)

The following units were completed on the above date:

_____ Accounts Payable Checks

_____ MSR Expense Checks

_____ MSR Salary Checks

_____ Bi-Weekly and Period Payroll Checks

_____ Suppliers Invoices (Excludes Rail, Truck and Express)

_____ _____

_____ _____

Disbursements Department, M-708

Signed _____

EXHIBIT 1

stance, it may be assumed that the following units of work were completed by the group during a pay period:

UNIT OF MEASUREMENT	NO. OF UNITS	STANDARD	STANDARD MINUTES DEVELOPED
Accounts payable checks	1337	4.32 min./check	5,776
MSR expense checks	874	3.24 min./check	2,832
MSR salary checks	449	2.60 min./check	1,167
Bi-weekly and monthly period payroll checks	4354	3.45 min./check	15,021
Suppliers' invoices	3358	2.33 min./invoice	7,824
Daily constant		3307.0 min./day	33,070
Overtime constant at 100%		781.0 min.	781
		Total standard mins. developed	66,471

If actual hours were 1,462, actual minutes were 87,720. Division of standard minutes developed by actual minutes would give an efficiency rating as follows:

66,741 standard minutes ÷ 87,720 = 75.8 per cent efficiency.

This result would be interpreted as 76 per cent efficiency for the group during the pay period. If at any time changes occur in methods, materials, layout, equipment, etc., the methods and standards department reserves the unqualified right to restudy all operations and to adjust any or all standards in proportion

BONUS BASE RATE MULTIPLIER SCALE

Percent of Efficiency	Bonus Base Rate Multiplier	Percent of Efficiency	Bonus Base Rate Multiplier	Percent of Efficiency	Bonus Base Rate Multiplier	Percent of Efficiency	Bonus Base Rate Multiplier
50	1.000	88	1.190	126	1.380	164	1.570
51	1.005	89	1.195	127	1.385	165	1.575
52	1.010	90	1.200	128	1.390	166	1.580
53	1.015	91	1.205	129	1.395	167	1.585
54	1.020	92	1.210	130	1.400	168	1.590
55	1.025	93	1.215	131	1.405	169	1.595
56	1.030	94	1.220	132	1.410	170	1.600
57	1.035	95	1.225	133	1.415	171	1.605
58	1.040	96	1.230	134	1.420	172	1.610
59	1.045	97	1.235	135	1.425	173	1.615
60	1.050	98	1.240	136	1.430	174	1.620
61	1.055	99	1.245	137	1.435	175	1.625
62	1.060	100	1.250	138	1.440	176	1.630
63	1.065	101	1.255	139	1.445	177	1.635
64	1.070	102	1.260	140	1.450	178	1.640
65	1.075	103	1.265	141	1.455	179	1.645
66	1.080	104	1.270	142	1.460	180	1.650
67	1.085	105	1.275	143	1.465	181	1.655
68	1.090	106	1.280	144	1.470	182	1.660
69	1.095	107	1.285	145	1.475	183	1.665
70	1.100	108	1.290	146	1.480	184	1.670
71	1.105	109	1.295	147	1.485	185	1.675
72	1.110	110	1.300	148	1.490	186	1.680
73	1.115	111	1.305	149	1.495	187	1.685
74	1.120	112	1.310	150	1.500	188	1.690
75	1.125	113	1.315	151	1.505	189	1.695
76	1.130	114	1.320	152	1.510	190	1.700
77	1.135	115	1.325	153	1.515	191	1.705
78	1.140	116	1.330	154	1.520	192	1.710
79	1.145	117	1.335	155	1.525	193	1.715
80	1.150	118	1.340	156	1.530	194	1.720
81	1.155	119	1.345	157	1.535	195	1.725
82	1.160	120	1.350	158	1.540	196	1.730
83	1.165	121	1.355	159	1.545	197	1.735
84	1.170	122	1.360	160	1.550	198	1.740
85	1.175	123	1.365	161	1.555	199	1.745
86	1.180	124	1.370	162	1.560	200	1.750
87	1.185	125	1.375	163	1.565		

EXHIBIT 2

to the effect of the change on existing standards. It is the responsibility of the department manager to notify the methods and standards department immediately when any such changes occur.

Computing Individual Pay at Group Efficiency

All employees who come under the plan have a bonus base rate usually referred to simply as a base rate or by the abbreviation B.B.R. This base rate is determined by the job evaluation rating for the job held and the over-all performance on the job. The amount of the individual's base rate (which each employee will always know) and the per cent of efficiency (which is available on each efficiency report posted in the department), will give the information

necessary to compute the hourly rate of pay for the pay period. This hourly rate is the base rate times the multiplier for the applicable rate of efficiency in accordance with the scale prescribed in Exhibit 2. Interpolation is not necessary as any efficiency calculation falling between even per cents is rounded to the nearest whole per cent.

PAY CHECK STUB

Total paid hours include regular hours worked plus one and one-half times the number of overtime hours worked.

For information on wages, bonus, and hours, contact the Payroll Department,

Total Earnings	Total Paid Hours	B.B.R.M.* and/or Insp. Bonus	Attendance Bonus
112.52	80.00	1.120	5.00

*Bonus Base Rate Multiplier.

PLEASE RETAIN THIS STATEMENT OF YOUR EARNINGS

Exhibit 3

It has been indicated the employees paid monthly as well as bi-weekly are included in the plan. Naturally the group efficiency computation is for the shorter period. The bonus base rate multiplier of an employee paid on a monthly basis is the average of the multiplier for the group for the two or three complete periods, part or all of which fall in the month in question.

In addition, it has been noted that the incentive covers enumerated operations within the disbursements department. If the employee was on such work more than half the time during the period, his wages for the period will be figured as if he were on incentive full time. His hourly rate of pay (determined as has been described) multiplied by the number of hours in the pay period for which he is paid (overtime hours are included at one and one-half times the actual overtime hours worked) will give gross pay, not including attendance bonus, night work or Sunday bonus payments. Hence, a feature of the plan is that the employee is paid at the per cent of efficiency which is earned on the assigned

job for all the hours during a pay period, even though temporarily transferred up to fifty per cent of the time to another department.

Should the employee be on bonus on an assigned job less than half the time worked during a period, he still will not lose incentive pay. However, his bonus base rate multiplier will be the average of those applicable to the group's efficiency for the last two pay periods during which he was on bonus operations on an assigned job fifty per cent or more of the time.

Pay Computation Example

From the scale in Exhibit 2 it can be seen that 1.120 is the multiplier for seventy-four per cent efficiency for the group. Suppose Miss Jones' base rate is $1.20 per hour and that she worked eighty hours during the period with fifty per cent or more of the time on her assigned job spent on bonus. Her wages for the period would work out as follows:

$1.20	base rate
1.20	Multiplier for 74% efficiency
$1.344	Hourly rate of pay for period
× 80	Paid hours
$107.52	Wages for period

Attendance bonus and night work or Sunday bonus, if earned, would be added to the above wages. Her pay check stub would resemble that shown in Exhibit 3.

Goals of the Plan

With the incentive plan in operation, the employees are thus given an opportunity to increase their earnings by increasing their efficiency. The means of attaining increased efficiency is to reduce the time necessary to perform all the operations of the group in an accurate and thorough manner. Hence, the plan provides an opportunity to increase the earnings through bettering performance.

For success the plan must be laid out carefully with respect to the particular company's circumstances and utilized to the utmost. Such use is in the direction of helping materially to meet the national defense objectives, for the company which remains wholly unconcerned with government business will be an exception.

When Does Part of a Business Break Even?

by RAYMOND J. BARBER, JR.

Assistant Controller, Glen Alden Coal Co., Scranton, Pa.

Serviceable break-even analysis on a company-wide basis requires a discerning use of operating data but an especially difficult problem arises when it is attempted to determine break-even volume for a segment, whether it be a product, plant, or territory. The problem, which concerns costs not identifiable to such segments except by arbitrary allocation, is illustrated by the author who contends that allocation is an apparent solution only.

BUSINESS MEN HAVE ALWAYS REALIZED in a general way that, after a certain volume of business has been reached, any increase results in a pleasantly disproportionate increase in profits and that, oppositely, the same leverage factor is at work on the down side, resulting in serious losses when this magical "break-even point" is not reached. Knowing this but in many cases not knowing the position of the fulcrum or the lengths of the lever arms, many business men have regarded these factors as unknowable and have surrendered their reason to a philosophy of "volume at all costs" with various results. In fact, it was not until the middle nineteen twenties (soon after the inception of N. A. C. A.), that cost accountants began seriously to address themselves to the problem of evaluating in dollars and cents the various factors which combine to produce a profit or a loss over a given period of time. The formula gradually developed is the now familiar one under which the behavior of costs is analyzed into fixed and variable components, the total then being referred to the predominantly variable factor of business revenues.

A Case of "Not So Fast"

The quick appreciation by business management of the fundamental logic of this formula, sometimes referred to as the profit-volume formula, has encouraged cost accountants to hazard opinions, preceded by dollar signs, on the related but more intricate subject of break-even points. By the plausible expedient of observing the volume at which the revenue line of the profit-volume graph crosses the line of total expense, one can indeed get some idea of the total volume of business required for breaking even. There is a temptation, however, to place more than warrantable reliance upon a figure arrived at by

so superficial a method, particularly where there is a condition of multiple plants, multiple products, or multiple sales territories. The purpose of this paper is to examine the nature of some of the factors which need to be considered when a responsible analysis is being made of the break-even situation in companies in which one or more of these conditions exist.

The break-even point is variously defined, and the definition should be a tailor-made affair designed to meet the particular need or wish of management. For instance, the costs involved in the computation may or may not include expenses not requiring funds, such as depreciation. They may or may not include such non-expense outlays as corporate dividends. They will generally include interest expense. On the other hand, they will almost never include income taxes because such taxes do not begin to exist until after the break-even point has been reached. Hence studies in the field of break-even points require a great deal of preliminary thought about each phase. To deal capriciously with any of them is to invite severe criticism of the finished job.

Moreover, every break-even analysis is based squarely upon a responsible study of the incidence of the so-called fixed and variable costs (and revenues) upon the business. Conclusions regarding the break-even point cannot possibly be any better than the calibre of the computations and assumptions going into the prerequisite examination of the fixed and variable behavior of the various costs and revenues. Particular stress is laid on this point because it is felt that, in a good many cases, this obvious dependency is temporarily overlooked. One strictly technical assumption with respect to portrayal of break-even point data, accepted for purposes of this discussion, should perhaps be noted in passing. Although it is well known that the relationship of costs to volume is never depictable as a perfectly straight line, the old calculus principle that any curve may be deemed straight over short ranges comes into play to facilitate our computations in this complex field. In this paper, straight-line relationships will be assumed to obtain throughout.

In the simplest possible case of a single plant making a single product at a uniform pace at stable costs, and selling at an unchanging price, the job of determining the probable break-even point can safely be turned over to the straight mathematician who, applying methods of graphic or analytic geometry to the problem, will come out with a good and reliable answer as to the volume of business needed to "break-even." Unfortunately, this Utopian condition never obtains in real business life. Rather, in such real life cases, it becomes necessary to set aside the slide rules and settle down to a considerable period of just plain thinking before addressing one's self to the problem in hand.

Plant Break-Even Points

For instance, in the case of multiplant operation, Euclid appears to have forsaken us because the whole does not seem to equal the sum of its parts. This surprising result appears even if we make the simplifying assumption that only one product is being made at all the plants. The break-even volume at Plant A plus the break-even volume at Plant B is always less than the break-even volume of the two combined. An example will show that this is so and will indiacte why:

	COSTS CLEARLY APPLICABLE TO		NOT APPLICABLE TO EITHER PLANT BUT TO BOTH	TOTAL
	PLANT A	PLANT B		
Fixed expenses per month	$24,000	$21,000	$ 6,000	$ 51,000
Variable expenses per unit of product	50¢	60¢	—	—
Sales revenue per unit of product	90¢	90¢	—	—
Variable margin per unit of product	40¢	30¢	Say average is 35.3¢	
Number of units of product required to be sold per month fixed costs	60,000	70,000	17,000	147,000

In this example, the total fixed expense is $51,000 per month, of which $24,000 is definitely associated with the operation of Plant A and $21,000 with Plant B. These amounts would contain the salaries of the individual plant managers, real estate taxes and depreciation on the respective properties (when computed on passage of time rather than quantity of output) and so on. The other $6,000 per month is composed of general company expenses not clearly applicable to either plant but certainly applicable to both combined. This figure would contain such items as the salary of the president and the cost of advertising the product. The fact that the cost accounting department may apportion a part of all of this $6,000 to the individual plants as distributable overhead does not in any way change the economic reality of the case. The president's salary and advertising expenses simply cannot be said positively to apply to the product of Plant A in one definite amount and to that of Plant B in another definite amount. They are part of what are referred to in this example as costs not applicable to either plant but to both.

The product sells for 90¢ per unit. The variable cost (or, as it is sometimes called, the increment cost) of producing a unit is 50¢ in Plant A and 60¢ in Plant B. This means that every time a unit is sold out of Plant A's production, a "variable margin" of 40¢ is generated to help pay its $24,000 of fixed expenses and every time a unit is sold out of B's production a "variable margin" of 30¢ is similarly generated to apply on B's $21,000 of fixed expenses. It may be seen, therefore, in this simplified example, that Plant A covers its own fixed expenses at a volume of 60,000 units and Plant B at 70,000 units, but that the company as a whole will not break even until an additional 15,000 to 20,000

have been sold (depending upon which plant furnishes the quantity), making an aggregate monthly volume of some 147,000 units to break even.

The example which has been given represents just about the simplest possible multiple-plant condition, that of only two plants making a single product to sell at a single price. Yet, in spite of this unrealistic simplicity, it is necessary to conclude that even here the whole is not equal to the sum of its parts. Whereas the monthly break-even volume for Plant A is 60,000 units and for B it is 70,000, the company as a whole will not cover its fixed costs until one or both of the plants have produced and sold 145,000 to 150,000 units. From the standpoints of the two plant managers, the combined break-even volume is only 130,000, but from that of the president it is significantly higher. It is most important, therefore, that the cost accountant think twice and be sure that he understands the questioner's intent, before he undertakes to answer the innocent-sounding question, "What is our break-even point?"

Product Break-Even Points

But we are letting the matter go too easily if we stop here. In search of a situation more nearly true to life, we must ask what happens when more than one product is being produced and sold. Taking another example for this purpose, we can still keep it more simple than complex by assuming that the company consists of only one plant and that the plant makes two products, neither one being a joint product or by-product of the other. The second product was added to the line because the management did not feel comfortable without some diversification. The products are made with the same type of labor but part of the machinery used in the manufacture of each product is not usable for the other. Although—as stated—this example is just about as simple as the first one (involving two plants and one product), there is a new and somewhat complicating consideration. It is necessary to select an operating factor common to both products which can serve as a measuring stick for relating them to each other as to physical quantities. Several such units suggest themselves:

1. Total cost (including burden).
2. Direct cost (excluding burden).
3. Standard direct labor dollars or hours.
4. Selling price.
5. Weight, length, etc.

There would be circumstances under which one or another of these units would be particularly appropriate as a common medium of reference for the two products, but the one which would be the most likely to fit all cases is the

number of standard direct labor hours incorporated in each product. In line with this thought the following assumptions are made:

	COSTS CLEARLY APPLICABLE TO PRODUCT I	PRODUCT II	NOT APPLICABLE TO EITHER PRODUCT BUT TO BOTH	TOTAL
Fixed costs per month	$6,000	$10,000	$24,000	$40,000
Variable cost per standard direct labor hour	$ 3.00	$ 2.00	—	—
Sales revenue per standard direct labor hour	$ 4.50	$ 4.00	—	—
Variable margin per standard direct labor hour	$ 1.50	$ 2.00	Say average is $1.77	
Number of standard direct labor hours required per month to cover fixed costs	4,000 hrs.	5,000 hrs.	13,600 hrs.	22,600 hrs.

From the above table it will be seen that Product I may properly be said to have broken even as a product as soon as enough units of it have been sold in any given month to account for 4,000 standard direct labor hours and the same can be said for Product II when 5,000 standard direct labor hours have been sold. After these respective volumes are reached in a month, additional quantities must be available for helping to meet the $24,000 monthly fixed costs which are not specifically associated with either product but which must be covered if the company as a whole is to break even. To do this, it would take 16,000 "hours' worth" of Product I ($24,000 divided by $1.50) or 12,000 of Product II ($24,000 divided by $2.00) or any combination yielding the necessary $24,000 margin. In the example shown, 6,400 of the extra quantity has been furnished in Product I and 7,200 in Product II.

The assumptions in this example of two products from one plant, like those in the first example of one product from two plants, are greatly over-simplified for the sake of illustration, but the basic principle is concretely brought out. This is that the sum of the individual break-even volumes of the various products of a multiproduct plant is necessarily less than the aggregate break-even volume of all products combined. The whole seems not to equal the sum of its parts. The implication again is clear that the cost accountant who is confronted by questions concerning break-even points of individual products, needs to do a lot of feet-on-the-desk thinking before he can safely farm out the computation phases of the work to his aides.

Skilled Association of Costs Assumes Prime Importance

In the case of either multiple-plant or multiple-product conditions, the cost accountant must be absolutely sure of two things, opposite in nature but equiva-

lent in their importance in the development of sound answers. On one hand, he must see to it that the fixed costs he ascribes specifically to a plant or to a product contain only those fixed costs which are in clear logic associable with that plant or product, exclusive of any amounts which may have arrived there as a result of pro-rations accomplished in connection with other duties of the cost department. On the other hand, he must be sure that the variable costs he uses really do include all the costs which will vary in proportion to the quantity of product turned out. These may very well include not only direct material and direct labor but a certain amount of burden as well, because the latter frequently includes such truly direct items as varnish, screws, toting labor, process steam, and so on. In short, he must look with a discerning skepticism at every figure he plans to incorporate in this special break-even computation.

This is a markedly changed situation. Up until a few years ago, it was one of the cost accountant's major duties to try to make fixed costs have the appearance of being variable, i.e., to spread them over departments and products in such a way that they would finally look as though they were really a part of the cost of making a particular unit of product rather than just a cost of being in a position to make products. The custom of so doing, with its sorry concomitants of forced logic and obscured facts, undoubtedly had its beginning in the emphasis previously accorded the balance sheet as the principal financial statement, with the income statement secondary. The evaluation of inventory for balance sheets purposes was a primary objective of cost accounting.

Although the accent is now shifting, the majority of cost accountants have been brought up sternly in the school of "pro-rate everything." It is not at all surprising, therefore, that we find it hard to adopt an approach to cost analysis which seems to fly in the face of accumulated tradition. However, for the job of studying break-even points and profit-volume behavior, it is essential, not only to avoid arbitrary apportionments of cost but even to filter out such apportionments as may have crept into the raw data which are furnished to the fixed-and-variable cost student.

Territory Break-Even Points

Up to now, selling costs have not been discussed. They, too, are usually of a mixed nature. Some of them, such as commissions are proportional to the quantities sold whereas others are strictly fixed, e.g., the salary of the general sales manager. Moreover, some of the fixed expenses, like the item mentioned, apply to no one particular sales territory. Hence any attempt to estab-

lish a break-even point for a sales territory will encounter the same problems as were met with respect to plants and products. Here, too, an example will serve to illustrate the approach which can be made to the problem of break-even volumes as they apply to sales territories. The subject of cost accounting for marketing expenses lies outside the scope of this paper, but it will be assumed that the following data have been reliably ascertained:

	APPLICABLE CLEARLY TO: TERRITORY 1	TERRITORY 2	NOT APPLICABLE TO EITHER TERRITORY BUT TO BOTH	TOTAL
Fixed costs per month	$12,000	$ 9,000	$ 6,000	$27,000
Variable selling expense per sales dollar	4¢	6¢	—	—
Gross profit per sales dollar	36¢	36¢	—	—
Variable "territory margin" per sales dollar	32¢	30¢	Say average is 30.6¢	
Monthly sales volume required to cover fixed costs	$37,500	$30,000	$19,600	$87,100

This example presupposes two or three simplifying conditions. First, it is assumed that the cost of goods sold is entirely variable, i.e., that there is no fixed component of cost in the goods being sold. This condition could exist in a wholesaling business. The second assumption is that the sales dollar is a good basis of reference for gauging the variability of territory selling expense or, in other words, that when sales dollars double the variable selling expense will double also. The example likewise assumes that the gross profit per sales dollar is constant. These three simplifying assumptions may make it look as though a regular work-a-day problem would be too complex to be dealt with in this manner and, indeed, this would be partly true in that numerical precision of answers would be less gratifying than in the example shown. However, no matter how rough the computation might be, the fundamental behavior of the factors would be the same. In particular the break-even volume for the combined territories would be greater than the sum of the break-even volumes of Territory 1 and Territory 2, taken individually.

In the above example, every sales dollar realized in Territory 1 is capable of paying 32¢ toward the $12,000 fixed costs of the territory, which means that when $37,500 of sales have been rung up in a given month, that territory will have just covered its fixed costs or, as we say, it will have "broken even." The other territory enjoys a lower monthly fixed cost at $9,000 but it has a higher variable selling expense which detracts from the power of each sales dollar to meet these fixed expenses. It takes $30,000 of sales to cover the fixed monthly expenses in Territory 2.

Now, in addition to the fixed monthly costs which belong clearly to either

one territory or the other, there are $6,000 which have to do with the two in combination, but not with either one in particular (except as a cost accountant with a slide rule may have waved his hand and declared it to be so—and that kind of arbitrary allocation will defeat any break-even analysis before it gets started. Thus Salesman 1 will have to sell an extra $18,750 over and above his personal break-even point or Salesman 2 will have to sell $20,000 over his, in order that the two territories as a whole may break even. Of course, any combination of those two excesses would work and, in the example, it took $6,000 on the part of Salesman 1 and $13,600 on the part of Salesman 2, or a total of $19,000 in additional sales to do it.

Handle With Care

All three of the examples which have been presented—dual plants, dual products, and dual sales territories—have been kept extremely simple to avoid letting the fundamentals become obscured by a welter of complex assumptions. However, it is important again to refer to actual conditions, the real life of business. There the situations would not only be more complicated individually, but the three types here illustrated would undoubtedly interplay. But no matter how disheartenigly complex one's real life example might be, the following principle will hold whenever there are any fixed expenses which have to do with all plants or products or territories in general and not with any one in particular:

In any company having multiple plants, the sum of their individual break-even volumes will always be less than the break-even volume of the company as a whole. This is equally true where there are multiple products or multiple sales territories.

Accounting in general, and cost accounting in particular, has come a long way in the last twenty years in establishing a right to be thought of as a profession, with dignity and responsibility comparable to law or medicine. Having recently come into possession of a valuable but delicate tool in the break-even device, it behooves us to use it, not recklessly, but wisely and creditably in the advancement of management techniques.

THINKING OF RENEGOTIATION

AS WE HEAD in the direction of a war economy, one of the problems which accountants are going to face is that of renegotiation of government contracts. The new renegotiation act has broad coverage. We can profitably hark back to experience of World War II.

The fundamental data required from all companies subject to renegotiation were a balance sheet for the entire company and a profit and loss statement broken down into two main divisions (of which one was for civilian business and the other for government business), showing for each the percentage of profits to sales.

In the use of this data the first thing that the renegotiation officials ordinarily did was to take a broad general view of the company being renegotiated, in regard to the profit percentages as compared to the percentages earned in the industry as a whole. The next move made was to examine the return on civilian business as compared with that on government business. If the margin of profit shown on government sales was presented as much lower than on civilian business this circumstance naturally meant that there would have to be a sound explanation, thoroughly proven by the records, that either the goods were sold to the government at a lower price or the costs were higher on the defense business.

The time to begin preparations for the renegotiation of contracts is when the first contract is received. The margin of profit expected to be made on each contract should be examined carefully, particularly in relation to the normal profit mark-up, and records should be set up to show clearly any extra costs that have to go into government business.

CHARLES H. WOODS, *Mohawk Valley*

POINTS

COMPETENCE IN RESERVE

SOME MANAGEMENTS FROWN on a company-wide policy of having employees know more than their own jobs. It is then up to the chief accounting officer (or other department head) who wishes to build a good organization, to do so within the limits of his authority by changing his key personnel around until they are all acquainted with the operations of each subdivision of the department.

In our organization, we do not have an over-all job rotation plan—just an accounting department plan which has improved the department. Our setup includes sections for accounts payable, accounts receivable, budget, cost and payroll. The supervisor of each section has worked in each of the other sections. He is required to change the duties of the people under him until each person knows the duties of the whole department. During peak periods in the various sections, employees are loaned between sections and, in this way, we have trained the accounting personnel to understand the problems of the department as a whole.

R. LANE, *Chicago*

A CHANCE TO SERVE

UNQUESTIONABLY WE ARE ENTERING A PERIOD of controls and high taxes even more difficult than that experienced in World War II. It is essential, therefore, that management be furnished with the best possible tools for the job ahead.

Because financial reports are essential management tools, we in the accounting field face a greater challenge, as well as a greater opportunity, than ever before. In meeting that challenge it would be well to keep in mind a few basic principles.

OF VIEW

In the first place, historical costs are not enough, particularly if they are made available too long after the event. For that reason we should find new ways to speed up the accounting process. Furthermore, accounting data should be presented in a way which is understandable to others less skilled in accounting techniques. In other words, management should be furnished with reports which clearly point up the facts and the need, if any, for immediate action. In addition, we should not ask management to wade through all the details which it may not have the time nor the technical know-how to evaluate. Proper emphasis also avoids the possibility of important facts being overlooked.

We should exercise sound judgment in the matter of eliminating minutiae from our accounting statements. Accounting costs money and, if we are to combat the ever-growing paper work and mounting clerical costs, we must simplify our procedures wherever possible. We can never win the battle with "general" overhead unless we pull on the oars every minute. In this battle it will not hurt us to use a little imagination. It will be an exhilarating experience and will be sure to produce a better procedure or method.

These ideas are presented, not as original, but as bearing reiteration. Now, just to summarize:

1. Keep accounting data current and understandable.
2. Highlight essential facts.
3. Eliminate minutiae.
4. Eliminate all nonessential accounting procedures.
5. Use imagination.

R. L. FEDERMAN, *Twin Cities*

SPECIAL STUDIES SHOULD BE ROUTINE

THE PRIMARY RESPONSIBILITY of an operator, whether he be the plant manager or the subforeman of a production unit, is to produce the required quantity and quality of goods or services. His second responsibility is to produce these goods or furnish the services at a cost which will result in a fair profit to his company. It is impossible to know whether or not the lowest possible cost has been obtained, without the assistance of the accountant.

In order for the accountant to render this assistance, he must furnish the operator and management with factual information contained in reports which can be readily understood. The reports should be brief but complete, highlighting the items requiring immediate attention.

In addition, the accountant should periodically develop and make available data which will reflect trends in the cost of selected items. From information contained in these reports, the accountant should make detailed studies and prepare special analyses with recommendations for improvement. These reports may cover such items as material substitutions, labor quotas, use of lubricants or other supplies, packaging materials, delay time on production lines and miscellaneous delays from service units, such as trucking, tractors, cranes, etc. Operating practice is also a major cause of unfavorable costs and should not be overlooked in special surveys.

It is very probable that these special studies will necessitate securing advice and counsel from other departments, i.e., engineering, sales, metallurgical, and industrial engineering, before being released. All of those concerned should be given the opportunity to review the reports.

HERBERT E. NELSON, *Birmingham*

Fire and Business Interruption Claim Problems

by JOSEPH F. SULLIVAN

Partner, Alexander Grant & Co., Chicago, Ill.

The present article leads the way into a technical field with which the industrial accountant must often deal in the interests of his company as a claimant under the policies insuring against fire loss. Emphasis is placed on documentation of inventory losses and of profits losses, under coverage appropriate to each.

THIS ARTICLE IS PRIMARILY CONCERNED with the documentation and verification of a claim for loss resulting from the occurrence of a disastrous fire. Incidently, the term "loss" is employed somewhat loosely in insurance circles. It is used here only to denote the measurement of damage inflicted upon an insured because of the occurrence of a hazard insured against. For purposes of simplicity, the term "fire" will be employed to denote the hazard insured against. This will make it unnecessary to specify sundry hazards often included in the coverage of fire policies. Therefore, to put the matter precisely, after a fire has occurred it is necessary for the insured to compute its loss and present its claim to the insuring company.

Insureds Face Many Post-Fire Duties

When a disastrous fire has been extinguished the insured is confronted with many problems. Those who have never experienced such an event can imagine but cannot fully realize the magnitude of the problems involved. The insured must take all necessary precautionary measures to protect the property from further damage. He must notify the insurance company. He must consult with the adjuster about removing the debris and segregating salvageable equipment and merchandise. He should confer with the adjuster about rebuilding the destroyed plant and securing equipment, fixtures and inventory.

Further, if business interruption insurance is carried, he should consult with the adjuster with respect to the advisability of conducting a temporary operation. It is simple to refer to these various problems in a passing way, but the actual details involved are staggering. Then, when these problems are resolved, the insured must prepare claims for loss of building, contents and business interruption. The insured must bear in mind that, while the obligation to pay the loss rests upon the insuring company, the obligation to prove

the loss rests upon the insured. Consequently, the insured should use the utmost caution in preparing the claim. Although no part of fire loss establishment is simple the accounting problems encountered in preparing building and equipment claims are usually less difficult than those encountered in connection with claims for inventory loss and claims for business interruption loss. The latter types will be considered in this article.

CLAIMS FOR DAMAGE TO INVENTORY

In physical character there are two kinds of inventory losses:

1. Those in which all damaged property is in sight.
2. Those in which it is evident that some property is destroyed or unidentifiable.

To some extent, of course, the degree of the destruction of the inventory will depend upon the type of product manufactured. It is difficult to completely obliterate items such as heavy machinery, even if in the process of construction. On the other hand, wooden or plastic products can easily be damaged beyond the point of recognition or count. In any event, caution should be exercised to determine that the value of all merchandise is included in the insured's claim, whether the merchandise is in sight or out of sight.

"In Sight" Losses

When the damaged inventory is in sight, a physical inventory should be taken as soon as possible after the fire. The inventory should be classified at the time of the count as to raw materials, work-in-process and finished goods, if possible, and should be further segregated into the following categories:

1. Undamaged merchandise.
2. Salvageable merchandise.
3. Unsalvageable merchandise.

After the count is completed, the undamaged and salvageable inventory should be moved to a safe place. It is wise to obtain permission from the adjuster before the junkman is called in to remove the unsalvageable inventory. In many instances the loss adjuster is available to the insured and either he or his representative will sometimes assist in the inventory count. When the adjuster is available, the insured should consult with him frequently in order that he may be advised of the insured's procedures.

The inventory should then be priced in accordance with the basis set forth in the policy, which for a manufacturer is usually cost. Material prices may be supported by recent purchase invoices. The other components of work-in-

process and finished goods may be supported by cost records or by reasonable estimates if cost records are not available or are unreliable. When the items have been priced, extended and footed, the insured will be able to present a claim which will show quantities and dollar values and can readily determine the amount of insurable value and the amount of insurance required, for the purpose of ascertaining whether or not the coinsurance clause is applicable. The amount of loss can be determined by eliminating from value the undamaged and salvageable inventory and adding an allowance for repairs.

"Out-of-Sight" Losses Where Perpetual Inventory Exists

Since this presentation centers around the conditions of a disastrous fire, it may well be that some inventory is out of sight. The insured should take a physical inventory of the undamaged and salvageable merchandise, if any, and should follow the steps previously described to determine the value thereof. Under these circumstances, the insured has recourse to one or both of the following methods for the determination of insurable value and loss:

1. From a perpetual inventory record.
2. By the gross profit method of computing inventory.

In order to employ a perpetual inventory record in preparing a claim for loss, the insured should be able to demonstrate that the record is maintained in accordance with good accounting practice and will adequately support the claim. The best evidence for this purpose, with respect to quantities, is to demonstrate that periodic physical inventories are taken, that the quantity counts are compared with the book record, and that the differences, if any, have been minor.

If both prices and quantities are maintained in the inventory record, it is a comparatively simple matter to determine the amount of inventory on hand at the date of the fire. It should be understood, of course, that all posting media have been properly recorded to that date. If only quantities are maintained in the record, then the insured will follow the same steps with respect to pricing as though a physical inventory had been taken.

"Out-of-Sight Losses"—Determination by Gross Profit Method

It must be recognized that not all firms maintain perpetual inventory records which may be used in connection with "out-of-sight" losses. In these cases, there is a straight forward basic approach. The inventory must be computed on the gross profit method. Stated simply, the beginning inventory plus net mer-

chandise purchases or cost of material and labor and overhead incurred for the period, less net sales at cost, should equal the inventory at the time of the fire. With respect to the documentation of the figures underlying the computation of the amount of inventory on hand at the date of the fire under the gross profit method, the best evidence for each item may be summarized as follows:

1. Opening inventory is best supported by a physical inventory properly taken, priced and extended.
2. Net purchases of materials may be supported by invoices with underlying evidence of receipt. Labor costs may be supported by time cards or wage records. Overhead expenses and charges may be supported by invoices or by computation.
3. Net sales may be verified by sales invoices with supporting evidence of shipment, such as bills of lading.
4. Gross profit rate may be computed on the basis of that earned for the immediately preceding period or for a comparable period, plus or minus the effect of factors described later which might require consideration.

While the theory is simple, there are many practical problems which may arise in supporting "out-of-sight" losses by the gross profit method. One of the problems frequently encountered by adjusters is the contention that the amount of beginning inventory recorded on the books was conservatively stated and that, consequently, the computation of loss should be made on the basis of a higher amount for the opening inventory.

In such cases the adjuster is faced with a difficult decision because, if the opening inventory is increased, the closing inventory will also increase, thus increasing the amount of loss involved. Needless to say, adjustments to the beginning inventory require positive support. If a physical inventory is available which shows that the adjustments embodying the conservatism claimed were made neither because of obsolescence nor for the purpose of providing a reserve for unsaleable merchandise, the adjuster may permit the insured to eliminate the adjustments. It is well to point out, perhaps, that adjusters are usually aware of the fact that an item which is obsolete in the beginning inventory, is probably still obsolete at the time of a fire.

Another problem which arises is in connection with a satisfactory determination of the rate of gross profit to employ in order to reduce the amount of net sales to cost. The fact that financial statements indicate a gross profit rate of 25 per cent in an immediately preceding period, may or may not be acceptable evidence that the same rate was earned during the period under consideration. There are many factors which can and do affect the rate of gross profit. All of these factors must be considered by the insured before the claim is prepared, because the adjuster or his representative will usually take pains to satisfy himself on these points. Some of these factors are:

1. Increase or decrease in sales price.
2. Increase or decrease in the cost of sales factors, that is, material, labor and overhead.
3. Change in the type of product handled.
4. Fluctuation in volume of sales among products.

Assuming that the foregoing problems are solved, the result obtained by using the gross profit method of computing inventory will represent the amount of insurable value on the basis of cost. If the coinsurance clause is inoperative, the amount of undamaged and salvageable merchandise will be deducted and an estimated allowance for repairs will be added, to arrive at the amount of loss. As previously indicated, the insured should be careful to enter in the sales and purchase records only the transactions made prior to the time of the fire. Numerous errors discovered in recorded transactions can only create a question in the mind of the adjuster and can readily make him suspicious of all information submitted to him in support of a claim for loss.

CLAIMS FOR BUSINESS INTERRUPTION LOSSES

After the building and contents claims have been prepared, the insured must consider the claim for loss for the period that business is interrupted because of a fire, if such loss has been insured against. The importance of business interruption insurance can best be emphasized by pointing out that a relatively minor fire can create a substantial loss. For example, a fire in an enameling furnace could possibly create a production bottleneck causing a severe loss because of the interruption of business, while the property loss may be relatively minor. There is no fixed relationship between property damage loss and business interruption loss.

Characteristics of Business Interruption Insurance

It is difficult to resolve the question as to when a business interruption claim should be prepared or settled. Usually the adjusted will be guided by the desire of the insured, unless there are special circumstances. In some cases it would be a financial hardship for the insured to wait until the period of suspension of business is accomplished before the claim is considered. Consequently, the adjuster may consider the problem of settling the claim on the basis of estimating expenses for a remaining portion of the suspension period. However, in other cases, if the problems of loss determination are too numerous or too difficult, the adjuster will readily grant an extension of time for filing the claim beyond the period of sixty days specified in the policy.

Many businessmen are under the impression that business interruption insurance is something within the realm of the mysterious. However, those who have worked with this type of insurance know full well that there is no mystery about it. The theory is simple and is clearly demonstrated by a few adages such as:

> "Business interruption insurance, if properly written, will place the insured financially in the same position after a fire that he would have been in had no fire occurred."
> "Business interruption insurance can do for the insured, profit-wise, exactly what he could have done for himself, had no fire occurred."

Based upon these adages, the insured who suffers a disastrous fire should realize no financial loss. This is the theory. While the theory is simple, the practical application of the theory, as limited by the policy form, can become a complicated problem. If the insured is to suffer no business interruption loss as a result of a disastrous fire, it is necessary to determine the financial position in which the insured would have been at the end of the suspension period, had no fire occurred. This is not always an easy problem to resolve.

We are considering here principally the documentation and verification of losses. However, it might be well to review briefly the salient points of the policies generally in use today in most localities. They are the two-item contribution form and the gross earnings form. Briefly, both forms state in effect that if the property described in the policy is damaged or destroyed by one of the perils insured against, so as to necessitate a total or partial suspension of business, the insured is protected for the amount of loss as defined (not exceeding the face amount of the policy or the actual loss sustained) for such length of time as would be required with the exercise of due diligence and dispatch to rebuild, repair or replace the property.

Two-Item Contribution Form of Business Interruption Coverage

With respect to the two-item contribution form, the insured may recover under Item 1 the loss of net profit and such charges and expenses, except ordinary payroll, as must necessarily continue during a total or partial suspension of business, to the extent only that such charges and expenses would have been earned had no fire occurred. Under the contribution clause the amount of recoverable loss is limited to the proportion that the amount of insurance written bears to 80 per cent (usually) of the sum of the annual net profits and the annual amount of all charges and other expenses (except the insured's entire ordinary payroll expense and the expense of heat, light and power) that would have been earned, had no loss occurred, during the twelve months immediately

following the date of damage or destruction. This applies whether or not these charges or expenses necessarily continue during a partial or total suspension of business.

Confusion with respect to these provisions is one of the major stumbling blocks in this form of business interruption insurance. Many insureds believe that they are required to carry too large an amount of insurance because recovery is limited to continuing expenses only and the amount of insurance required is based upon all expenses whether continuing or not. These insureds fail to realize that the shorter the period of suspension the greater the amount of necessarily continuing expenses.

Also, no consideration is given to the fact that the premiums charged are based upon the amount required by the insuring companies to pay losses and expenses and realize a fair profit. If the loss ratio is high, premium rates will be increased. Of if the formula for computing the amount of premiums due is changed, the rate would have to be changed so that the total premiums received would be sufficient to cover losses. Again, many insureds erroneously compute the amount of insurance required on the basis of continuing expenses rather than on the basis outlined in the contribution clause. Therefore, if a fire should occur, the contribution clause becomes effective and the insured cannot recover the full amount of loss. Specific attention is appropriately directed to the fact that the amount of insurance required to be carried under Item 1 in order to avoid the application of the contribution clause, is based upon anticipated amounts of income and expense for the twelve months immediately following the date of a fire.

Under Item 2 of the two-item form, the insured may recover the amount of ordinary payroll expended for a period of ninety days following the fire, provided the amount of insurance carried is equivalent to 80 per cent of the insured's entire ordinary payroll expense which would have been earned had no fire occurred, during the ninety consecutive days immediately following the date of damage or destruction. Recovery is also limited to payments made to persons to the extent necessary to resume the normal business of the insured with the same quality of service that existed immediately preceding the fire.

Thus ordinary payroll is insured separately in the two-item contribution form. In some cases it is difficult to determine what comprises ordinary payroll. Usually all salaries and wages are included, except payments to officers, executives, department managers, employees under contract and other important employees. Incidentally, the term ordinary payroll should not be confused with the accounting terms, "ordinary labor" or "direct labor."

Gross Earnings Form of Business Interruption Coverage

In contrast, it is not necessary to segregate ordinary payroll under the gross earnings form which is the other principal type of business interruption insurance policy. The insured may recover the reduction in gross earnings, as defined, less charges and expenses which do not necessarily continue during a total or partial suspension of business resulting from a fire. Under the contribution clause in this case, the insured, to recover his full loss, must carry in coverage a percentage (usually 50 per cent) of the gross earnings which would have been earned had no fire occurred, during the twelve months immediately following the date of damage or destruction. It is perhaps important to comment that the term, "gross earnings," used in the form should not be confused with the accounting term, "gross profit."

Fundamental Considerations in Business Interruption Claims

The following are the important clauses to consider with respect to the accounting work required in connection with the preparation of a claim for loss, whichever one of the forms is used for coverage:

1. The insured may never recover more than the actual amount of loss sustained.
2. Expenses incurred for the purpose of reducing loss are not subject to the application of the coinsurance clause but recovery of these expenses is limited to the amount by which the loss is reduced.
3. In computing the amount of insurable value and the amount of insurance required, consideration should be given to the experience of the business prior to the fire and probable experience after a fire.

For purposes of discussion, it will be assumed that certain matters referred to in other clauses in the forms have been considered and are closed issues in the adjustments. These are:

1. The insured has complied with the resumption of operations clause, in that every reasonable effort has been made to commence operations as quickly as possible and that consideration has been given to the feasibility of conducting a temporary or partial operation.
2. The period of suspension has been agreed to by both the adjuster and the insured. This is a major problem in itself and, for the most part, is more than an accounting problem. If the adjuster is satisfied that the insured has acted as an ordinary prudent business man should, the problem may be simplified. The period of suspension would include the length of time required to replace raw materials and work-in-process. Both of these periods are usually limited to thirty days each in the forms.

With these underlying facts in mind, it is in order to proceed to the matter of documentation and verification of the business interruption claim for loss. The steps required to prepare a business interruption claim (not necessarily in the order taken) are as follows:

1. Preparation of a forecast or projection of operations for the twelve months immediately following the fire.
2. Computation of amounts of insurable value and insurance required, based upon the projection of operations for the twelve months following the fire.
3. Preparation of a forecast of operations for the period of suspension. As a matter of fact, this forecast is actually a part of Step 1 and is so considered in the explanatory matter which follows this list.
4. Preparation of statement of actual income and expense incurred during the period of suspension. If this claim is prepared prior to the termination of the period of suspension, then the actual figures available should be compiled and estimates should be made for the remaining portion of the period.
5. Preparation of list of expenses incurred to reduce loss.
6. Computation of loss and amount of recoverable loss.

Each of these steps will be considered in the following paragraphs.

Preparation of Projections of Operations

Projection of operations for the period of twelve months immediately following the fire is required under the terms of the contribution clause. The projection of operations for the period of suspension is required under the terms of the recovery clause. In preparing these projections, it must be remembered that the policy provides, in effect, that consideration should be given to the experience of the business prior to the fire and the probable experience thereafter. The length of time to consider prior to the fire is unlimited. Consequently, the period used in each case will depend upon the circumstances involved. In some cases, a relatively short period immediately preceding the fire may be used. Again, it may be necessary to consider a period of one year or more.

The preparation of these forecasts or projections presents what are probably the two most important and most difficult problems encountered in preparing a business interruption claim. Yet relatively little about them is heard, either at the time the policy is written or at the time a fire occurs. It is usually when the adjuster or his representative begins the work in connection with the verification of a claim for loss that the uninformed insured begins to realize the problems involved.

The preparation of the required forecasts is indeed similar to the preparation of a budget. In order to illustrate the similarity, it will be helpful to consider the information usually required by the adjuster or his representative to support the insured's computation of insurable value. The minimum information is as follows:

1. A brief summary of the insured's operations, setting forth the type of business, the products manufactured and products merchandised or services rendered, and any pertinent information which may be peculiar to the insured's business.

2. Summary of sales by products by months for a period of at least twelve months before the fire. The purpose of this summary is to disclose any significant trend in total sales or in sales of a particular product. Changes in sales of products with varying rates of gross profit can have a significant bearing upon future operations.
3. Monthly statements of income for at least twelve months before the fire. These statements should show the rate of gross profit earned and all necessary operating details.
4. List of orders on hand at the date of the fire, showing the scheduled delivery dates.
5. Verification of sales and inventory cut-off at time of fire.

In addition to these matters, there are many other points which may have to be considered in any particular assignment. For example, in a recent case a manufacturer had expanded manufacturing facilities, hired additional salesmen, and had begun an extensive advertising campaign in a new territory when a fire destroyed the insured's plant. Two years before, practically the same program of expansion had been followed in another territory and it was definitely successful. These facts would necessarily have to be considered in computing the amount of insurance required and the amount of loss sustained. Unfortunately, in the case just mentioned, the insured had not placed more business interruption insurance to reflect expansion and, while the amount of loss was increased, the coinsurance percentage was also increased.

Insurable Value and Coinsurance Under Two-Item Coverage

When the forecast of operations for the twelve months immediately following the fire has been completed and is properly supported, the amount of insurable value and the amount of insurance required may be computed. There are worksheets of various types available for this purpose. However, unless adequate consideration is given to all of the salient factors, these worksheets may be misleading. Without question, they are valuable after a detailed projection, as explained above, is prepared.

Under Item 1 of the two-item contribution form, the easiest method to follow in making the computation of the amount of insurance required is to spread the pertinent figures on a columnar schedule. The account titles should be inserted in the left-hand column. The actual results of operations for the period on which the projection is based should be inserted in the first dollar column. The forecast for the twelve months or suspension period, if that is under consideration, should be inserted in the second dollar column and the amounts which comprise insurable value may be inserted in the next column.

Referring again to the wording of the policy, the amount of insurable value is represented by the amount of net profit plus all charges and expenses—except ordinary payroll and heat, light and power—whether continuing or not,

which would have been earned if no fire had occurred. Therefore, the third column should include net profit and other insurable items only. There are some items that are questionable as to inclusion, such as commissions to salesmen and royalty payments. These may or may not be included, depending upon the circumstances in each case. In any event, the total of the amounts in the third column will represent the amount of insurable value.

The remaining columns on this schedule may be used to record the projection of operations for the period of suspension and the actual operating results for this same period.

Under Item 2 of the two-item form, it is necessary to compute the amount of ordinary payroll which would have been earned had no fire occurred, during the period of ninety days immediately following the fire. This amount, of course, should be a part of the amount of ordinary payroll included in the forecast prepared for the twelve months.

The amount of insurance required with respect to Item 1 may be obtained by multiplying the amount of insurable value by the coinsurance percentage specified in the policy. This will determine whether or not the coinsurance clause is operative. The test to determine whether or not the coinsurance clause is applicable under Item 2 may then be made by multiplying insurable value for ninety days by the coinsurance percentage and comparing the result with the amount of insurance carried.

Insurable Value and Coinsurance Under Gross Earnings Form

The procedure in computing the amount of insurable value under the gross earnings form is somewhat more simple than the computation required under Item 1 of the two-item form. The amount of gross earnings, or insurable value, is determined by deducting from the amount of sales, all sales deductions—such as discounts, returns and allowances, bad debts, brokerage paid and the like—and the cost of materials and supplies absorbed in production. The amount of gross earnings may then be multiplied by the percentage specified in the policy to determine whether or not the coinsurance clause is applicable.

In the gross earnings form for a manufacturing company, the term "sales value of production" is employed in defining gross earnings instead of the term "sales." This terminology has created some difficult problems because of the inference that an insured may recover on the basis of full production capacity rather than on the basis of production sold. Since the insured may recover only the actual amount of loss sustained, it seems clear, strictly from an

accounting standpoint, that a sale would have to be contemplated before a loss can be claimed. Consequently, the insured must show evidence of a probable sale of production claimed as lost, in order to support an actual loss of gross earnings.

Income and Expense During Period of Suspension

Under ordinary conditions, it is a simple matter to prepare the statement of income and expense for the period of suspension or for the completed portion of the period of suspension if the claim for loss is to be settled prior to resumption of operations. The various items of income and expense incurred during this period should be supported by the customary documentary evidence, such as sales invoices, if any, purchase invoices, wage tickets and the like. In the event of a disastrous loss, it is possible that the insured will have little, if any, income, particularly from sales.

The expenses incurred during the period of suspension following a disastrous fire are usually greatly reduced as compared with those incurred during a normal operating period. It must be borne in mind, also, that the insured may recover only those business expenses which must necessarily continue. This is one particularly important point which many insureds are inclined to overlook. The adjuster or his representative will usually examine invoices supporting expenditures, for the purpose of determining that expenses and charges included in the statement of income for the suspension period, are legitimate business expenses. Those which are not are eliminated, and properly so. In some instances, the cost of supplies and inventories which have been paid for in the contents claim may be inadvertently included among these actual expenses. Since the insured has already been paid for these items, it cannot recover the cost again by charging the items as expenses against income in the period of interruption.

Expenses Incurred to Reduce Loss

Under both the policy forms being considered, expenses incurred to reduce loss are recoverable in full unless these items exceed the amount by which the loss is reduced. As to the nature of these expenses, it is generally agreed among adjusters that certain types of expenses are clearly incurred for the purpose of reducing loss. Examples of these are as follows:

1. Expenses to move and install machinery and equipment in a temporary location.
2. Expenses to prepare a temporary location for use, such as wiring or minor remodeling.
3. Unusual expenses incurred to obtain merchandise or items of equipment, in order to reduce the time involved in the period of suspension.

Again there are items, such as overtime to regular employees, which are controversial. As a protective measure, the insured should consult with the adjuster in respect of these items and have a definite understanding as to the items which will be recognized as expenses incurred to reduce loss. As indicated, the amount recoverable may not exceed the amount by which the loss is reduced. Consequently, it is necessary to determine the amount of loss that would have been suffered if such expenses had not been incurred. Ordinarily this computation is made by the adjuster.

Computation of Loss

After the basic information is compiled, the computation of business interruption loss is a comparatively simple matter. Under Item 1 of the two-item form, the insured's loss will be represented by the net profit as shown in the forecast for the period of suspension plus the amount of continuing charges and expenses, except ordinary payroll, which are all included in the statement of income and expense for the period of suspension. When the insured is actually able to carry on some type of operation during the period of suspension, the loss may be represented by the amount of net profit shown in the forecast for the period of suspension minus or plus the profit or loss actually realized. If the coinsurance clause has been complied with, the amount thus determined is also the amount of recoverable loss.

Under the gross earnings form, the loss may be computed in a similar manner, except that payments made for ordinary payroll which are permitted under the terms of the policy, are included. Actually the policy wording is different but, with the exception of ordinary payroll, the answer should be the same.

Under Item 2 of the two-item form, payments made in accordance with the terms of the policy for ordinary payroll may be recovered unless the coinsurance clause is applicable, in which case the amount will be reduced.

Current Conditions Bear on Business Interruption Settlements

At the present time there are a few unusual situations which must be considered in connection with business interrruption insurance, such as:

1. The scarcity of certain raw materials.
2. Increasing labor rates and material prices.
3. The possibility of a freeze of sale prices.
4. Change-over to war work.
5. Renegotiation.

Each of these problems must be investigated thoroughly before it is possible to satisfy oneself that a forecast is correctly prepared. Lack of materials may

definitely restrict production and, consequently, sales. The freezing of sales prices and increases in wage rates and material prices will have a definite effect upon the rate of gross profit which can be earned. A change-over to war work may mean that historical information with respect to operations has little, if any, value. As a result of renegotiation, the rate of net profit which can be earned will be limited. These are a few of the problems which must be faced by every insured and there are no hard and fast answers that can be formulated to solve them. Each case will have to be considered on its own merits.

SUMMARY

In this paper, the subject of supporting fire loss claims has been considered under two heads. Fire damage loss claims were first dealt with as exemplified in inventory damage losses and both "in sight" and "out-of-sight" loss procedures were taken up. With respect to the latter, it was pointed out that alternative methods of documenting the loss are based on perpetual inventory records and on the gross profit method inventory determination, respectively.

The latter portion of the paper has been concerned with losses from business interruption as a result of fire. Before undertaking to describe loss procedure, the two types of business interruption coverage—the two-item contribution type and the gross earnings type—were distinguished. Six steps required to document business interruption losses were then listed and elaborated upon. These steps included preparation of projections of operations, computation of insurable values, income and expense during the suspensions period, expenses to reduce loss, and loss computation.

It must be pointed out that the contents of this article, whatever specific cautions and particular information it has been possible to include, constitute a quick survey of the subject matter. The field is one for particular study relative to the situation of individual companies. In far too many instances, it is not accorded this study, with the result that losses are settled on a much less favorable basis to insureds, through no fault of the adjustment procedure, than would be the case if earlier and more assiduous attention had been given to future possibilities.

The Industrial Cafeteria Can Carry Its Costs

by GROVER C. SNYDER, JR.

Supervisor, Cost Reports and Analysis Section, Controller's Department, Lancaster Floor Plant, Armstrong Cork Co.

It is a viewpoint of the author of this paper that only the serious application of cost control techniques stands between a company and break-even operation of its cafeteria service for employees. Flexible budgeting for the cafeteria unit is made concrete by presentation of a hypothetical case based on practice at the author's company.

THE RAPID GROWTH of industrial cafeterias reflects in no small measure the departure from former industrial policies which would confine management's interest in employees primarily to productive effort, output, etc. Together with a realization that the health and welfare of employees is a mutual benefit, management began to show a decided interest in safety, wash rooms, fatigue elements and like matters. Of special concern was the problem of lunches brought to work by the employees. Surveys established that hot meals are necessary to supply the energy required to meet normal work activity. In addition, a steady diet of cold box lunches was believed responsible for a major portion of internal disorders suffered by employees.

The Armstrong Cork Company recognized the need for improving employees' lunches and, in 1921, opened an employee canteen which made available hot coffee, hot soup, and prepared sandwiches. Two years later the company expanded its food service department by opening a cafeteria which served full hot meat platters, salads, soups, pastries, and sandwiches in pleasant surroundings and at prices lower than those charged by public restaurants.

Formulation of Company Policy

As might be expected, entering the food service field involved also entering upon problems peculiar to the restaurant industry, with which the management had had little or no practical experience. As the food service unit began to grow, costs became increasingly more important and it was soon apparent that an operating profit was impracticable of expectation. In fact, serious losses were constantly being experienced. Almost without exception, wage rates for cafeteria personnel employed in industrial food service were on a comparable basis with production rates and, as a result, were considerably higher than rates for similar work in public cafeterias. In addition, the depreciation for buildings and equipment exceeded the rental paid by public units.

Hence management was faced with a policy decision. Inasmuch as an operating profit was neither expected nor desirable, operation on a break-even basis became the goal. However, it was found that this goal was difficult to attain. The losses in the food service operation continued and led to a thorough study of the problem. As a result of this study, two conclusions were reached with respect to accounting for the project:

1. **It is necessary to have complete and detailed costs of food service operations.**
2. **It is necessary to appraise performance currently through an analysis of operating costs.**

In operating practice and in accounting procedure—although not in respect of financial results—the company considers the food service operation in exactly the same light as production operations. The separation of cost elements charged to the food service department follows the company's chart of accounts and includes cost of food, salaries, labor, supplies, maintenance, depreciation, employee benefits, laundry, and prorations from other departments, such as water, light, power, mechanical overhead, taxes, and insurance. We strongly recommend this practice, so that management can determine the complete cost of food service operation by referring to the operating report.

Uneconomic Operation of Cafeterias Often Condoned

It is interesting to note that the charging of all costs against the food service operation is not a general practice in industrial cafeteria management. In 1949 the Eastman Kodak Company conducted a survey of industrial cafeterias and the results of the survey, as subsequently published, disclosed that, of the twenty units included, the food service department of the Lancaster Floor Plant of the Armstrong Cork Company was the only unit charged with all elements of cost normally charged to an operating department. In a number of companies, the report indicated, the food service department was not charged with the depreciation and maintenance on the building occupied. In other cases the operation was not charged with a share of employee programs, such as pensions, insurance, vacations, etc.

This situation may well be due to the attitude of plant cafeteria managers. In April 1950, at the conference of Industrial Cafeteria Managers' Association, held in Lancaster, the writer discussed this problem with the group. Without exception, the managers felt that their operations should not be considered in the same light as regular production operations. It was pointed out to them to deviate from normal company policy of charging costs would only mean that

cafeteria costs would have to be absorbed by other departments or operations and, as a result, a factual picture of the cafeteria operation would not be available to management. The counter-argument most frequently advanced by the cafeteria managers was that it is not possible for an industrial cafeteria to break even on costs, that this condition should be frankly recognized, and that the accounting should be readjusted accordingly.

That this was not necessarily true was indicated by the fact that the Floor Plant cafeteria of the Armstrong Cork Company had for a period of time been operating on a break-even basis, after absorbing all costs normally charged against a production operation, and this was pointed out to the group. The satisfactory performance of the cafeteria is attributable primarily to two factors. These are proper supervision and effective cost analysis. Alert and aggressive supervision will, of necessity, play a major part in the operating of any department. However, cost analysis places in the hands of the supervisor control tools which are necessary to achievement of the desired operating results.

First—A Flexible Budget for Cost Control

The first step in providing the supervisor with the proper cost control tools is the development of a flexible budget. This makes possible the calculation of allowable expense at the volume currently experienced. In our case the industrial engineer, cost analyst, and food service supervisor are jointly responsible for the development of this budget. Each item of cost is examined in the light of past experience to determine its behavior pattern at several levels of activity. This experience is adjusted for any anticipated major changes and a separation into fixed and variable components is then made.

The separation of costs into fixed and variable portions is imperative, if subsequent effect of volume is to be detemined. However, a word of caution is in order relative to the determination of the schedule upon which the fixed costs are to be based. It must be taken into consideration that, if fixed costs are established on a six or seven day week and it is later necessary to go to a five day week, a substantial loss because of volume will be incurred, which will not be fully offset by reductions in operating costs.

This budget, prepared annually, is used throughout the year in reporting for each segment of the operation the actual expense incurred and the gain or loss from expense budgeted. The monthly budgeted expense reports are reviewed jointly by the cost analyst and the food service supervisor in an effort to determine the cause of variances, and to eliminate those conditions which are inflicting losses and to maintain those conditions which are contributing gains.

Interpretation of Operating Results—An Example

The best way to present here the information which can be secured through the examination of the budgeted expense report is to take up the operations of the particular period by a particular cafeteria, and to follow them through to the point at which control becomes possible. The use of a hypothetical case makes the employment of figures simpler. First, the consolidated operating report for an industrial cafeteria may be considered to be as follows:

	ACTUALS	%
Sales	$28,661	100.00%
Cost of food	17,489	61.02
Gross profit	11,172	38.98
Expense:		
Labor (including salaries)	7,994	27.89
Others	3,013	10.52
Net margin	165	.57

While this report shows that a profit was earned, there is no way to ascertain whether the various cost elements were in line and the extent each contributed to the result. By enlarging this report to include performance based upon budget ratios, it is possible to make a limited comparison as shown below:

	ACTUAL	%	ACTUAL SALES, WITH COSTS AT BUDGET RATIOS	%	GAIN (LOSS)
Sales	$28,661	100.00	$28,661	100.00	
Cost of food	17,489	61.02	17,701	61.76	$212
Gross profit	11,172	38.98	10,960	38.24	
Expense:					
Labor	7,994	27.89	7,905	27.58	(89)
Others	3,013	10.52	3,055	10.66	42
Net margin	$ 165	.57	—	—	$165

It is now apparent that a gain of $212 was experienced for food costs, a loss of $89 for labor, and a gain of $42 for other expense. However, if we were to stop at this point, we would have only part of the story.

Volume most certainly contributes to the operating result and, since this particular unit was budgeted to break even at a volume of $30,000, to what extent did the loss in volume of $1,339 ($30,000-$28,661) affect the result? Also, the loss for labor might be due entirely to volume, in which case the food service supervisor would have operated within the budget. In order to answer these questions, express or implied, it is necessary to take a third step. Actual and budgeted costs must be separated into their fixed and variable components. Variances for fixed costs would be caused solely by volume, while other variances would reflect performance related to efficiency.

	ACTUAL		BUDGET		VARIANCES		
	FIXED	VARIABLE	FIXED	VARIABLE	VOLUME	EFFICIENCY	COST OF FOOD
Sales		$28,661		$28,661			
Cost of food		17,489		17,701			$212
Gross profit		11,172		10,960			
Expense:							
Labor	$4,488	3,506	$4,288	3,617	$(200)	$111	
Others	2,080	933	1,986	1,069	(94)	136	
Total expense	$6,568	$ 4,439	$6,274	$ 4,686	$294	$247	$212
Net margin	$ 165		$ —				

From this analysis, we now see that the loss of $89 for labor is the result of a loss of $200 caused by low volume, offset in part by a saving of $111 for efficient utilization of personnel. It is also apparent that, through efficient management, a saving of $136 was earned for other expense, which was offset in part by a loss of $94 because of low volume. In actual practice, the efficiency variances are further analyzed into their respective sources, e.g., labor variance is separated into salaries, wages, and overtime and shift differential. The same procedure is followed for other expense to determine individual source variances for laundering, employee benefits, maintenance, power, etc. Armed with this information the food service supervisor is in a strong position to take such corrective measures as may be indicated.

Food costs present a special problem. Included in the analysis is a variance gain of $212 for the cost of food. Several factors contribute to this variance, such as: (1) menu assortment, (2) waste, (3) size of portions, (4) yield from purchases, (5) inventory losses, and (6) fluctuations in purchase prices. The first five of these factors are directly under the constant scrutiny of the food service supervisor, although, in the absence of detailed inventory control records and standard portions, it is not possible to separately evaluate the effect of each one. The sixth item, fluctuation in purchase prices, is, to a large extent, beyond the control of the supervisor, who makes all purchases. It is, of course, recognized that price variations will seriously affect the operating-cost-of-food ratio. The food market has been extremely unstable over the past several years and food costs have varied greatly from month to month.

Index Approach to Isolation of Food Price Variance

At Armstrong Cork Company, in order to indicate the effect of price variations upon food costs, a cost of food index has been developed for the Floor Plant cafeteria. After discussion with our company economist, it was decided

to use May, 1946 as a base period and to express all indices in relation to this base. This period was selected primarily because it covered the food cost period just prior to the elimination of the O.P.A. regulations.

The method employed in building the index was that generally followed in the development of a cost index, in that items constituting a representative group were expressed in ratio to their usage and then extended at their respective purchase prices. Usages must, of course, be expressed in terms of a single commodity and, for our purpose, we used a pound of butter as the base unit and expressed usage of all other items in ratio to a pound of butter. For example, if the consumption of beef is at the ratio of 100 pounds of beef to 3 pounds of butter, then the usage factor for beef would be 100 ÷ 3 or 33.33 and a cost index based upon these two units only, would be as follows:

COMMODITY	UNIT	FACTOR	PRICE UNIT	COST INDEX
Butter	Lb.	1	$.800	800
Beef	"	33.33	.325	10,832
				11,632

Our index is calculated monthly and reflects current prices. A comparison of the current index with the base period shows the per cent of increase in food costs since May, 1946. However, since budget operating ratios are established yearly and are based upon current operating conditions, the cost index for the base period no longer reflects the ratio at which the current budget cost of food was established. It becomes necessary, therefore, to determine the position on the cost index chart which reflects the current budget cost of food ratio. This ratio for 1950 was calculated to be 143 per cent of the base.

Since our current index is 146 per cent, the loss on food costs due to price would be 146% — 153% × 17,489 = $525, to relate the figures of our hypothetical case to this index. Referring further to the variance analysis, a saving of $212 is shown for the cost of food. Since a loss of $525 is indicated because of food prices, the performance of those under the direct control of the supervisor must have contributed a saving of $737 to result in the net saving of $212.

It must, of course, be borne in mind that the use of a coat index can be only indicative of conditions and should be used primarily to show trends. However, in an operation in which the volume will not support the expense necessary for portion control and detailed inventory records, the cost index can be considered sufficiently accurate for the purpose of variance interpretation.

Labor and Expense Efficiencies

The efficiency variance for labor, shown in the variance summary, is a saving of $111. As mentioned previously, this variance is to be further analyzed into salaries, wages, and overtime and shift differential. The analysis may be supposed to have disclosed the following in this instance:

Salaries	$ (3)
Wages	173
Overtime, shift differential	(59)
	$111

The saving for wages was the result of reducing the working force by one utility man. Loss for overtime and shift differential was incurred as the result of servicing two special evening dinners during the month.

The efficiency variance gain of $136 for other expense, which the variance summary displays, was also subjected to additional analysis, which disclosed that the largest single factor contributing to the gain was a saving of $110 for supplies and dishes.

Springboards for Cost Control Action

Satisfactory operating results can be maintained in plant cafeterias if the accountant provides the supervisor with a detailed analysis of his costs. This analysis should include:

1. A detailed reporting on all costs applicable in the operation.
2. A flexible budget against which operating costs are currently measured.
3. A detailed analysis of differences between actual and budgeted costs.

A Contractor's Equipment Records

by WILLIAM D. HAMILTON

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There are a wide variety of circumstances in which the "rent or buy" equipment problem of a contractor must be resolved. Some equipment items will be rented, others bought. Sometimes purchase is a suitable consequence of rental. Hence, there are a similar variety of records needed. The present article describes how one company keeps orderly record of equipment and equipment obligations under these conditions.

THE CONTRACTOR has a costing situation which is unique in American business. While the usual manufacturer produces a standard product, the contractor continually undertakes new projects, under often dissimilar conditions. In substance, he has a job order type of production with each job order of substantial financial proportions. To complicate his situation, he is confronted at the start, in almost every case, with the need to know costs in advance.

The contractor must budget his costs and compute his cash requirements with extreme accuracy, so that his bid at a contract letting will secure the contract and at the same time return a fair margin of profit. Once the contract is obtained, the margin of profit realized in carrying it out is dependent upon the accuracy of these computations, if it be assumed that a reasonably high level of operational efficiency is maintained. Thus, although a great segment of American business has long operated without the tool of budgeting, apparently with some measure of success, the contractor's success or failure has always depended upon the accuracy of a budget or precomputed estimate of the costs required to complete a project.

Needs for Equipment Neither Predictable Nor Permanent

To the highway or earth-moving contractor, the two greatest single factors of cost are labor and machines. Labor is more readily adaptable to computation ahead of time. This paper will concern itself primarily with an aspect of machine costs, particularly with respect to records underlying purchase cost and depreciation, as well as rental cost, of expensive equipment. If we look at the balance sheet of a contracting company, we shall find that the bulk of the company's invested money is in equipment. When subjected to the strains of earth-

working projects, the useful life of this equipment is short indeed. Due to rapid technical improvements, the obsolescence factor, in addition, becomes extremely significant.

Proper accounting for plant and equipment facilities becomes a difficult but essential factor to successful operation. In this presentation the records which our company makes of new facilities, from the time the equipment is acquired until it is sold, traded, or retired, will be examined. In the usual situation, such new facilities are added on very short notice for the reason that the company is:

1. The successful bidder on a large number of surfacing contracts which cannot be completed within the specified time with current plant facilities.
2. The successful bidder on a project which requires the addition of certain new equipment in order to successfully meet the contract specifications.
3. Confronted with newer equipment which makes present facilities obsolete.

Any one of the above situations may be handled by outright purchase of additional equipment (providing sufficient working capital is available), straight rental from the manufacturer or jobber, rental of the equipment with recapture clause, and installment purchase of the needed plant facilities. In our operation we have used each of the four methods. It is the intention here to discuss briefly the last three methods, as they apply, and to show examples of the records kept.

Rent or Buy?

First, however, a word on the elements of choice between purchasing and renting equipment, may orient the reader for the discussion. In determining whether the equipment should be purchased or whether it should be rented, the obsolescence factor becomes the most important consideration, i.e., when can we expect to find another letting, after a particular contract is completed, which will require use of the same machine? If there are no projects developing which would require similar equipment, it may be well to rent the eqiupment even though such rentals will total nearly as much as the purchase price. The added cost to purchase, regardless of how small, may well be lost in subsequent obsolescence. It should be noted, too, that these considerations may apply, not only to special equipment, but also to such commonly used equipment as a traxcavator. A particular letting may simply require more units of this type than future contracts can be expected to require.

In this choice between purchase and rental, the income tax becomes a second important cost consideration and one of which management must be made aware. Let it be assumed that a large piece of equipment can be purchased for $18,000 and that such equipment will be needed for twelve months and could be rented for $1,500 per month. Perhaps it is most doubtful that future lettings

(after the twelve-month period) will require similar equipment for some time, even though the particular equipment will still be in good operational condition. Used equipment may have little resale value.

If the equipment is rented, there is no question but that the rent is deductible expense. If the item is purchased, it may be extremely difficult to convince representatives of the Bureau of Internal Revenue that the entire cost should be charged to one contract when the machine, itself, is in good condition at the

Memo Record of Rented Equipment

Purchased After Being Charged to Contract

Item Traxcavator Date Title Transferred 2-1-50

Acquired of Jones & Co. Total Rental Paid $21,000.00

Date When New	Dealers Price	Depreciation		Remaining Value
1-15-49	20,000.00	To 2-1-50	7,000.00	13,000.00
		3-1-50	500.00	12,500.00
		4-1-50	500.00	12,000.00

EXHIBIT 1

conclusion of the project. At excess profits tax rates, this decision may have important effects on the company's financial status one year hence. Add to the income tax cost, subsequent storage expense and property taxes—and it may prove far wiser to rent.

Purchase of Rented Equipment Which Has Been Charged to Jobs

If the decision is made to rent a machine, the rental payments are charged directly to the rental expense account for this particular contract as progress is made under the contract. Perhaps, however, due to weather delays, the project is not completed for thirteen months and rental payments have now exceeded the price at which the machinery distributor would have originally sold the equipment. It has been our experience that, when this situation is called to the attention of the machinery distributor, he will be willing to transfer ownership of the machine to the company at only a nominal further price or none at all. We are then in the position of owning a machine with a no-cost basis.

For such equipment, we maintain a separate equipment ledger. This ledger is not an integral part of the business records but is, in a sense, a memoradum ledger. A sample ledger card from this memorandum ledger is shown as Exhibit 1. The reasons for such ledger are fourfold:

1. It constitutes a readily accessible record of equipment otherwise buried in prior rental expense accounts, and permits management to know at all times the total equipment available for possible future lettings.
2. The state highway commissions, for which we perform, require certified financial statements to be filed. While the certified balance sheets cannot include values for this charged-out equipment, a supplementary schedule can be included in the report submitted, showing "additional equipment available carried at no cost on the balance sheet". As ability to perform is an important consideration in lettings by highway commissions, the supplemental schedule serves an important function. It indicates from the record of our memorandum ledger the age, condition and value of such equipment.
3. The record affords the bonding company, also, with a better index of our ability to perform, than would otherwise be available.
4. In computing the maximum bid we believe we can make and still be low bidder, the memorandum ledger provides an indication of costs which competitors, without similar machines, must compute in submitting their bids.

Reference to Exhibit 1 will indicate that the purchase price originally quoted us is entered and reasonable depreciation is charged, the rate taking into consideration wear and tear, together with the obsolescence factor.

Other Purchase Methods; Outright Purchase

If it is concluded that new equipment will be purchased, this may be done as outright purchase, rental-with-recapture clause, or installment purchase. In accounting in the general records, for asset and depreciation accounts with respect to outright purchases, our methods are standard and will not be discussed. However, with respect to the accounting for obligations under installment and rental-with-recapture purchase methods, we have developed procedures which have proven advantageous to our situation.

Rental-with-Recapture Clause

The rental-with-recapture clause contract provides that the equipment is rented at a fixed monthly rate but that, if the contractor elects before a specified date to purchase, the rental payments made will be applied on the purchase price. Such agreements are particularly advantageous with respect to newly-developed machines not yet proven in the field. If the machine operates satisfactorily, the contractor may exercise his election to purchase, without losing the rentals paid. If the machine fails to measure up to expectations, he can return the machine without further obligation, losing only the rentals already paid. (It should be

noted that the contractor expects and intends to purchase under such agreements and that the Commissioner of Internal Revenue interprets all such agreements as purchases, if exercised, with none of the payments considered rentals.)

In Exhibit 2 the detail ledger form used to record equipment under a rental agreement is shown. In order to have a control in the general ledger, we have established an account known as "equipment obligations—rental". This account

Detail Record of Equipment

Rental Obligation and Payments

Item Tractor

Bought of Jones & Jones Pay to Jones & Jones

	Date of Payment	Rental	Principal Balance	Payment Date Check Number	Payment Date Date
			14,000.00		
1	11-1-50	2,000.00	12,000.00	387	10-31-50
2	12-1	2,000.00	10,300.00	462	11-30
3	1-1-51	2,000.00	8,000.00	578	12-31
4	2-1	2,000.00	6,000.00	679	1-31-51
5	3-1	2,000.00	4,000.00	760	2-28
6	4-1	2,000.00	2,000.00	890	3-31
7	5-1	2,000.00			

EXHIBIT 2

is credited with the total rental obligations at the time the equipment is delivered, and is charged with the monthly rental payments.

Installment Purchases of Equipment

Installment purchases are handled quite similarly to rental contracts except that this is a more formal purchase, in which a note covering the amount of the principal and interest is signed. Installment purchases are set up either in terms of stated monthly payments including interest or stated monthly payments plus interest.

Record of Equipment Purchase

Installment Obligations - Stated Payments Including Interest

Item International Truck T802

Bought of Doe & Doe Pay to Smith & Doe

	Date Payments Due	Principal	Interest	Total Pay't	Principal Balance	Interest Balance	Payment Data Check No.	Payment Data Date
					2,250.00	202.50		
1	9-1-49	114.93	21.32	136.25	2,135.07	181.18	779	8-29-49
2	10-1	116.12	20.13	136.26	2,018.95	161.05	998	9-26
3	11-1	117.30	18.95	136.25	1,901.65	142.10	1179	10-25
4	12-1	118.49	17.76	136.25	1,783.16	124.34	1421	11-25
5	1-1-50	119.67	16.58	136.25	1,663.49	107.76	1643	12-22
6	2-1	120.86	15.39	136.25	1,542.63	92.37	1873	1-24-50
7	3-1	122.04	14.21	136.25	1,420.59	78.16	2035	2-25
8	4-1	123.22	13.03	136.25	1,297.37	65.13	2186	3-23-
9	5-1	124.41	11.84	136.25	1,172.96	53.29	2387	4-24
10	6-1	125.59	10.66	136.25	1,047.37	42.63	2583	5-25
11	7-1	126.78	9.47	136.25	920.59	33.16	2778	6-20
12	8-1	127.96	8.29	126.25	792.63	24.87	2989	7-24
13	5-1	129.14	7.11	136.25	663.49	17.76	3211	8-26
14	10-1	130.33	5.92	136.25	533.16	11.84	3509	9-28
15	11-1	131.51	4.74	136.25	401.65	7.10	3758	10-26
16	12-1	132.70	3.55	136.25	268.95	3.55		
17	1-1-51	133.88	2.37	136.25	135.07	1.18		
18	2-1	135.07	1.18	136.25				
171		2,250.00	202.50	2,452.50				

EXHIBIT 3

Exhibit 3 shows the computation and payment schedule for the installment purchase contract of the first type. For the interest expense to be accurately charged under this method, it must be worked out for each payment in the schedule as well as in total. We prorate the interest by taking the sum of the payment numbers, which is 171 in this case, and—on the figures given—computing interest in the first payment as 18/171 of $202.50, in the second payment as 17/171 of $202.50, etc. We feel that this method gives accurate interest

costs. The results may be compared with average interest cost which, in the example, would have been $11.25 per month.

In the case of stated monthly payments plus interest, the schedule differs a little from Exhibit 3, the primary difference being that the principal payments are usually of an equal amount during the entire payment period, with the interest computed on the unpaid balance. This is exemplified in Exhibit 4. In the illustration, the first interest payment is computed from the date of the note to the date the first installment is due, thereafter on a thirty-day basis.

Record of Equipment Purchases

Installment Obligation - Stated Principal Payment

Item Scraper

Bought of Doe and Doe Pay to Smith and Doe

	Date Payment Due	Principal	Interest	Total Payment	Principal Balance	Payment Data	
						Check No.	Date
					3,760.00		
1	8-1-50	750.00	66.43	816.43	3,010.00	3018	7-29-50
2	9-1	750.00	15.05	765.05	2,260.00	3214	8-26
3	10-1	750.00	11.30	761.30	1,510.00	3510	9-28
4	11-1	750.00	7.55	757.55	760.00	3759	10-26
5	12-1	760.00	3.80	763.80	-		

EXHIBIT 4

As in the case of rental items, an account was set up in the general ledger. It is known as "equipment obligations—notes payable". It is credited with the total notes payable on equipment and charged with the amount paid on the principal each month. The interest paid on the notes is charged to interest expense at the time payment is made.

The advantages gained here are:

1. Accurate interest costs.
2. Complete payment record which becomes part of the fixed asset invoice papers when payment is completed.
3. Quick reference for unpaid obligation on each item.
4. Interest and principal payments predetermined for those issuing checks.
5. Auditing by independent auditors made easier.

What Our Equipment Records Give Us

In summary, our system fills three principal needs. It provides a standard property ledger to account for the depreciation cost of facilities purchased. It includes a supplementary property ledger to record added facilities available and a relative depreciation cost for computing contract bids, though such equipment was acquired primarily through rentals. It affords a system for accurately providing interest and principal balances on equipment purchase obligations. Our endeavor has been to control effectively, in this way, the largest item of investment and cost to the contracting company.

THE WORKSHOP

The Control Problem at the Management Level

by Harry Hodge

Controller and Assistant to the President, Allen B. Wrisley Co., Chicago, Ill.

THE NEED FOR CONTROL starts with the very setup of a business enterprise. Practically speaking, control becomes a very personal matter. Not only does management require control —control is required of management. Although a corporation is an impersonal entity, corporate management must satisfy the varied and often conflicting demands of at least the following persons:

1. Stockholders.
2. Directors.
3. Representatives of supervisory departments and agencies such as—
   - Secretary of State of the state of incorporation.
   - Bureau of Internal Revenue.
   - National Labor Relations Board.
   - Federal Trade Commission.
   - Interstate Commerce Commission.
   - Economic Control Administration.

However, control is perhaps more often thought of as involving efficient and orderly execution of functions which management must delegate. Just as management must be effective to satisfy the owners of an enterprise and others, so must control within the organization be effective to satisfy management. Here, most of all, it is a markedly personal matter. The control process implies a high degree of knowledge, understanding, cooperation and coordination plus a receptive mental attitude. These must be part of the "climate" at all levels. They are "personality" characteristics which must be recognized and considered by management in regard to its own activities as well as the activities of subordinates.

Control a Twin of Delegation

When the need for delegation arises, the need for control co-exists. In an enterprise which is small enough to be completely managed by the principal (whatever the legal structure), the manager is control personalized. He has everything "at his finger tips." However, as the demands upon his time increase, it is necessary for him to delegate one or more of a combination of three types of prerogatives, i.e., duties, responsibility, and/or authority. Duties may be delegated without delegating responsibility for performance or authority to initiate performance or may be delegated together with either responsibility or authority or both. The ability of a management to delegate duties, responsibility and authority in order to remain available for new

tasks and creative effort, is indicative of its effectiveness. However, there is one "if". Adequate control must be maintained.

The Defensive Approach

Because control is personal, it is affected by the same faults which often impair personality. Love of protective immersion in detail, fear of loss of control and the inability or lack of courage to delegate, account for the preponderance of mediocre managements in today's business world. They fumble along in their own narrow channels, expending their entire available time controlling the details of those phases of the business that are of greatest interest to them. They are carried forward by the progress of the enterprise, if any, for they do not have available time for creating forward motion. It is a characteristic of this type of management to develop what I term a "defensive" philosophy of control. The doctrine of this philosophy is "if you make a mistake, be prepared to defend yourself." Typical ramifications are:

1. Management is inclined to delegate duties but to retain responsibility.
2. Management attempts to set the pace as a prime discloser of errors.
3. Management always has time to "run down" errors and seek explanations.
4. Staff is encouraged to disclose errors to the highest possible levels of supervision.
5. Staff, from supervision down to the least clerk, diverts time and effort from assigned duties to the anticipating of possible errors and the developing and maintenance of formal and informal devices to disclose the errors of others or to explain away errors of their own commission.
6. Staff is inclined to "throw curves" when it does not have a ready explanation.
7. Staff is inclined to excessive bickering.

Aside from the prohibitive amount of duplication of effort, the high cost of which it is difficult to isolate, this philosophy frequently produces an over-staffed organization. There is also a tendency to develop specialists in lower ranking positions, as a protective measure. Hence it becomes also necessary to pay premium rates in order to encourage qualified personnel to remain static, position-wise. Most important, however, is the impediment to the forward motion of the enterprise each time an error is disclosed and everyone from management on down stops long enough to make its excuses.

Taking the Offensive

In contrast, there is a philosophy of control, offensive instead of defensive, which corresponds to the more positive side of personality. Here the emphasis is on prevention and correction of errors rather than on disclosure. Every motion, according to this philosophy, should be a deliberate forward motion. It requires a maximum delegation of duties, responsibility and authority and involves the selection and training of high-grade personnel capable of absorbing all that management passes down. It creates a dynamic organization, discourages over-

staffing, and depends little on specialization in lower-grade positions.

The viewpoint, itself, is better, for the staff will consciously allot mental effort and subsconsciously allot time to prevention and correction which would otherwise be expended on defense and disclosure. Fewer errors result and morale is better. The staff does not have to spend time or effort on defensive mechanisms but is urged on to greater effort under closer supervision. Management directs its own effort toward determining the effect of error, rather than the mere fact of it, and toward action to offset any negative effect rather than toward securing —and being content with—an explanation.

If there were a conscious choice to be made, I do not believe that any management would choose the "defensive" philosophy. However, such a choice is seldom made. The philosophy of management is evolutionary and the groups which have succumbed to the "defensive" philosophy do not have the time to stop and choose a different course. Those which have developed the "offensive" philosophy would not alter theirs.

Policy Is Top Level Control

Regardless of the classification into which the business falls as a legal entity, the highest ranking form of self-imposed limitation or control is policy. Policy must, of course, be compatible with documentary restrictions imposed by governing bodies or with contractual restrictions, if any. Company policy may be stated or implied. Preferably, it should be stated, for again we meet the personal factor. A clear light can be followed.

Stated policy should be catalogued and circulated throughout the company. As new employees are added, their training should include a review of company policy as it affects them and the jobs they are assuming. An orderly procedure for publicizing changes, additions and deletions should be established, so that all employees will become acquainted with them.

The Beginning Is Important

Beyond this approximate point in the scheme of management, control loses its individuality and, while its collective contribution to effective management is great, its design and functioning are generally consistent with an academic pattern. However, the importance of the control concept at its origination in management's delegation of duties and in its essentially personal character, must not be lost sight of if it is to work well in the areas where control devices necessarily impose procedures and routines. Only the "offensive" type of control will develop a spirited, well-adjusted organization and only clear-cut policy from the top will be reflected in clear understanding at all levels.

Departmentalizing Cost Control

by HOWARD K. PAYNE

Supervisor of Cost Survey Department and Budget Control Administrator, John Deere Des Moines Works

A COST CONTROL and cost reduction department is designed to provide management with a centralized means of handling cost control and cost investigation problems in a scientific manner and embracing the operation of the entire plant. It is important that this department be separate from both the accounting department and the production department. If it is distinct from these departments, interference with their routines is obviated and hasty decisions on matters for special investigation are avoided. The department is properly responsible to both the general manager and the general superintendent.

Working Setup and Staff

The department is appropriately broken down into three or four divisions.

1. Budgetary control.
2. Standard practice.
3. Employee suggestion investigation.
4. General cost investigation.
(Numbers 3 and 4 may be combined.)

A staff of from six to twelve employees (depending upon the duties assigned to the department and the size of the plant) make a workable unit. The following position classifications reflects the minimum duties which will devolve upon the department:

1. Department supervisor.
2. Budget control administrator.
3. Standard practice secretary and investigator.
4. Two or more suggestion investigators.
5. Department stenographer.
6. Department clerks.

Responsibility of Department Head

The supervisor is in complete charge of the department. He serves as chairman of all cost reduction meetings, as well as chairman of the employees' suggestion committee and the standard practice committee and acts as office coordinator. His previous training should include both factory and office experience. He must realize that cost control is only a means to the end and that he is not management but a tool for management. He must remember that all cost reduction programs contain the human element. It is recommended that he have past experience as budget control administrator. His formal education should include a B.S. in accounting and possibly a M.B.A. The salary should be commensurate with his training and experience.

He serves as a connecting link between the production and accounting departments and it is his job to sell

cost control to the department heads. He must be a diplomat and a friend of supervisors, in order for the company to secure the maximum benefit from the department. He must secure full cooperation and backing from both the general superintendent and the general manager.

Budget Control Administration

The budget control administrator answers directly to the department supervisor and serves as the assistant department head. His chief duties are to establish, adjust when necessary, and maintain budgets for productive, service, shipping and foundry departments. He budgets these departments on direct labor, indirect labor, scrap, and all labor and material used by a service department but actually chargeable to another department. He usually has a clerk or two who answer directly to him.

This division prepares charts and cost data for various interested parties. Weekly departmental labor and material analysis sheets are worked up and distributed by his unit. Monthly budget comparison statements also originate from this division. The work order clerk and the machine record clerk will usually work under the budget administrator.

Promoting Standard Practice

The standard practice secretary and investigator has a dual part to play. He answers directly to the department supervisor and indirectly to the standard practice committee. As secretary, he presents all statements received by him from the department heads, for discussion at the standard practice committee meetings. Upon recommendation of the chairman, he notifies members of the meetings, completes arrangement for the conference room and records minutes of these meetings. He also maintains the record of the manuals which may be issued and prepares and inserts all new and revised instructions after they have been approved.

As investigator, it is the duty of this individual to check periodically, in an impartial manner, on adherence to the standard practice instructions. He reports any deviation or violation to the committee so that action can be taken to correct faulty compliance. He also acts as a cost investigator.

Working the Suggestion System

The chief suggestion investigator answers directly to the department supervisor. He is assisted by other investigators who are usually ex-tool or die men, production foremen, time study men or mechanical engineers. This assures thorough investigations by experienced persons.

As a typical instance, an employee suggests that we substitute a cast iron spider on a steel ring gear, rather than have the entire gear made from a

forging. Some of the questions for which accurate answers must be obtained are indicated below:

1. Has the suggestion been previously submitted?
2. Is the idea feasible?
3. What will be the complete cost of finished forging as proposed?
4. What is the amount of scrap on the present forging?
5. How much is the anticipated complete cost of gear on spider?
6. At what level is anticipated scrap on the proposed parts?
7. Is foundry capacity available?
8. Is machining capacity available?
9. Is any additional material handling involved?
10. What will the cost of the change-over be if adopted?
11. Will it improve our product?
12. What will be the actual savings?

Suggestions may be in many areas. The following three groups (which constitute a partial list only) indicate how broad the field is:

OUR PRODUCT	MANUFACTURING
Quality	Methods
Design	Tools
Workmanship	Jigs
Waste	Fixtures
Material	Power
Simplicity	Operation
Reliability	Scrap

FACTORY CONDITIONS

Accident and fire prevention
Health
Sanitation
Order and neatness
Lighting
Waste

Three copies of the suggestion are typed, complete except for name and clock number, and assigned to the investigators.

The department head who is concerned will conduct one investigation and submit his recommendation. Another department head makes a separate investigation and submits his recommendation. So does the employee suggestion investigator from the cost reduction staff. When the three investigators have completed their work, they meet with the chairman of the committee to decide upon the financial award, if any, payable to the originator. If none, an explanatory letter is written.

Place and Tools of the Department

The ideal location for the cost reduction department is between the accounting and timekeeping departments where important records (labor, material and scrap) are easily accessible.

As to equipment, office machines will vary with the accounting system in use. However, the minimum department facilities should include a typewriter, a ten-digit listing adding machine and a fully automatic calculator.

Results to be Anticipated

A centralized cost control and cost reduction department, when properly administered, can serve as the coordinating unit for all related activities, combining them where feasible and so eliminating a vast amount of paper work. The direct result will be a smaller force of better employees operating at a very high degree of efficiency. The final result will be greater profits.

Cost and Operating Control in a Small Company

by WILLIAM E. WESTERDAHL
Public Cost Accountant, Minneapolis, Minn.

MANY SMALL FIRMS FEEL that they cannot afford what they consider as the "luxury" of a cost accounting system and budgetary control. Very often they are paying many times its cost for its absence and consequent inefficiency, poor scheduling, and failure of executives to become cost-conscious and vigilant over expenses. In this article there is outlined a system in use in a small manufacturing firm (approximately 40 employees), which makes several standard items each with a number of parts. The system has not only controlled costs but, in addition, has helped in the scheduling of parts through the operating departments of the plant.

Operation and Fly Sheets; Job Card

An Operation Sheet which forms the lefthand portion of Exhibit 1 is made up for every part that requires an operation in the plant as well as for every subassembly and assembly. This sheet lists the materials required for each piece, with the standard price, and lists also the operations in sequence and the department involved, the machine on which the work will probably be done, and the standard setup and running times per piece. Results of each run appear in the columns of a fly sheet, also shown in Exhibit 1. The lower section of the form and fly sheet alike are used for accumulating overhead costs by departments and total costs for the part. Operation sheets with fly sheets for previous runs for a specified period are filed in a "dead" file except when the related part is scheduled to run or is running. The sheet is then withdrawn from file and a blank fly sheet clipped to it with lines positioned to the side captions of the sheet. The job order number, part number, number of pieces scheduled to start, and the date the run is to be started are entered as identifying data at the top of the fly sheet. It will be noted that the columns in the body of the fly sheet make provision for application of standards and development of variances.

Job Cards (Exhibit 2) and material requisitions are made out in advance from these operation sheets. It should be noted that there is a separate job card for each operation. Heading information includes job order number, name of part and part number, department, machine number, number of pieces scheduled, and date required. If standards are used, the standard time for the operation can be included on this card and will prove useful for scheduling.

The Job In Process

When the job cards for all operations for the part to be run have been

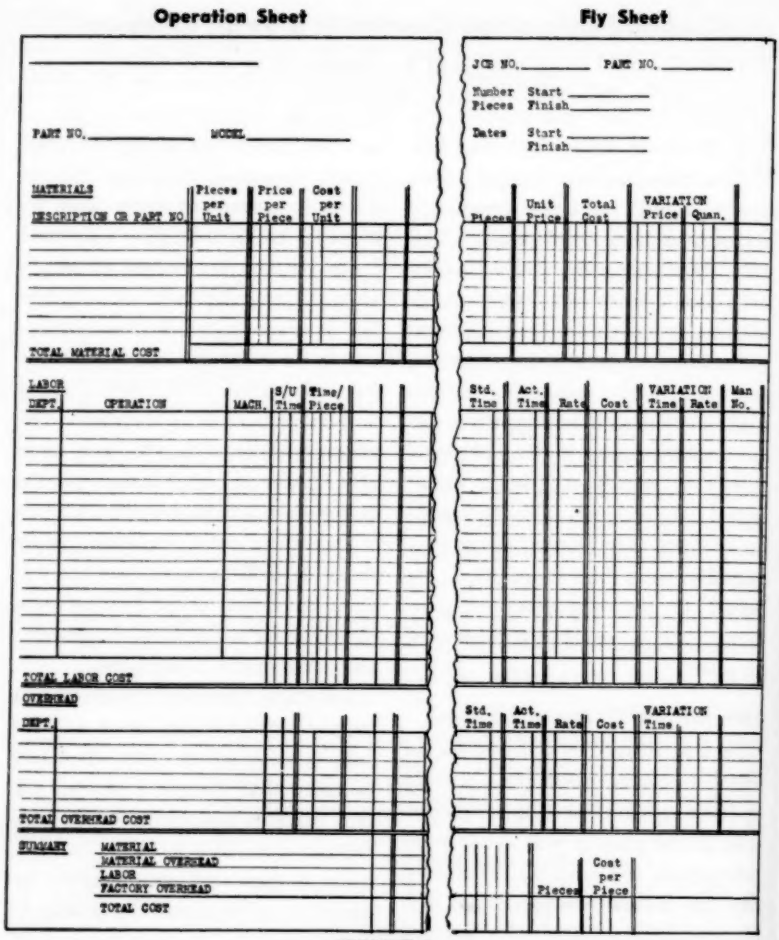

EXHIBIT 1

made out, the operation sheet and fly sheet are filed in a work-in-process loose-leaf notebook in part number sequence and the job cards and material requisitions go to the foreman or whoever does the scheduling. A separate rack is provided for each machine and the cards are filed in these racks according to priority of the job. The procedure thus embodies scheduling of the work. If at any time the foreman wishes to determine the amount of work ahead of any machine, he can readily determine this from the cards in the

Job Card

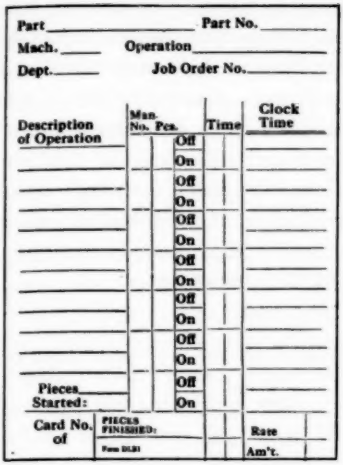
Part_____ Part No._____
Mach._____ Operation_____
Dept._____ Job Order No._____
Description of Operation | Man No. | Pcs. | | Time | Clock Time
Off
On
Pieces Started:
Card No. of
PIECES FINISHED:
Rate
Am't.

EXHIBIT 2

rack for that machine.

A few hours before the job is ready to be run, the foreman notifies the stock clerk to deliver the materials to the machine in question by giving him the material requisition. When the worker finishes the previous job, the foreman hands the blue-print and job card to him. The worker writes his number on the card and punches it at the clock for the time he begins the job. If the job takes several days to run, time is punched off each night and on again the next morning. When the operation is finished, the final punch-off is recorded and the number of good pieces completed entered by the operator. (This should be verified by the stockman or foreman when the run is completely finished.)

Record of Completed Job

The cards then go to the cost clerk. He calculates the elapsed time for each operation and enters the time, number of pieces, and each man's clock number on the fly sheet attached to the operations sheet. If standards or estimates are used, he then checks the time against standards. If standards are not used, he checks the time for the run against work on the previous run. Where a man has beaten the standard or previous time by an appreciable amount, the job card is given to the foreman (or superintendent, if more practicable).

This procedure keeps supervisors informed of the unusually good or bad jobs and thus provides control. In cases in which it is not practical to set standards by time studies, it may be advisable to use best previous time as the "standard" and enter this on the operation sheet (in pencil so that it may be changed whenever the time per piece is beaten). If this best previous time is put on the job card before it goes out to the shop, the workers have an incentive to beat past performance. However, the fact must not be overlooked that operation may consider this as acceptable performance and pace themselves accordingly.

At the bottom of the job card (lower right), there are lines which can be used for the total time. There is also room immediately to the left of

this for the standard or best previous time. The cards for the week can be sorted by man number and then "shingled" so that only the actual and standard or experienced times are showing. This enables the cost clerk to get total actual and total standard times for each man without transcribing the figures to a work sheet and pleted, the cost clerk knows the job should be finished. He totals the labor time and the labor cost and brings this cost down to the summary section of the fly sheet. Overhead is then applied based on direct labor hours in each department. The clerk also checks the number of pieces completed against the number of pieces started and de-

VARIABLE OVERHEAD EXPENSE 1950 - MACHINE SHOP

	January	February	Year to date	March	Year to date
Direct labor hours	1100	1000	2100	1300	3400
Direct labor cost	$1650	$1500	$3150	$1930	$5080
Variable Overhead					
Indirect labor					
Supervision	260	250	510	260	770
Repair and maintenance	25	30	55	26	81
Rework	18	30	48	12	60
Jig and fixture maintenance	18	25	43	5	48
Miscellaneous indirect labor	8	6	14	4	18
Sub-total (Labor)	(1979)	(1841)	(3820)	(2237)	(6057)
Payroll expense	148	138	286	168	454
Light and power	60	50	110	50	160
Heat	40	40	80	30	110
Miscellaneous supplies	70	65	135	52	187
Small tools	90	80	170	65	235
Repair parts	25	40	65	15	80
General expense	100	120	220	95	315
Total Variable Overhead	$ 862	$874	$1736	$ 782	$2518
Variable Overhead Rate	$ .78	$.87	$ .83	$ .60	$ .74

(Note: All figures fictitious)

EXHIBIT 3

assists in efficiency calculation and labor distribution. At this time the rate can be entered and the job cost calculated on the fly sheet. If standards are used, the variations can be calculated at this time also.

When the last operation is completed, the cost clerk knows the job should be finished. He totals the labor time and the labor cost and brings this cost down to the summary section of the fly sheet. Overhead is then applied based on direct labor hours in each department. The clerk also checks the number of pieces completed against the number of pieces started and determines why there is any appreciable shortage or overage. Quantities as well as unit prices are then picked up on the finished parts stock record form. The operation sheet and insert sheets are returned to the inactive file until the job is run again.

Budget Basis for Burden

In small plants it often happens that the foreman has the authority to purchase small tools, miscellaneous supplies, and repair parts as he needs them. Indirect labor may be entirely within his jurisdiction. Without some sort of control these items of expense may get out of line. Similarly, heat and power costs may become excessive under a foreman's utilization, if they are not watched. Top management personnel just does not have the time to analyze these various items of expense and determine whether or not they are out of line. For these reasons, it is not until the foremen become expense-conscious that a company begins to get cost control.

A budget which includes variable and semivariable overhead items at experienced volumes is serviceable to point out to the foreman just where his costs are too high. This budget can be made up with past experience as a guide, by breaking down expenses by departments and expense categories.

If, because there has not been too much effort to control expenses in the past, it is felt that the resulting allowances will be rather "loose," it may be wiser to disregard past experience and collect experience data watchfully for six months or a year before setting up the budget, and using this information as the basis for the budget. The assembling of the data in a practical form, as illustrated by Exhibit 3 may, itself, initiate cost control if regularly reviewed with the superintendent and foremen.

There is a definite routine which is helpful in collecting information for this recapitulation sheet and in further making supervision expense conscious. After an invoice has been entered in the books and paid, it is sent to the superintendent, who indicates the classification of the expense (whether small tools, miscellaneous supplies, repair part, experimental work, etc.) and the department to which it is to be charged. This keeps before him what is being bought and what the items cost.

These invoices are then listed on standing orders (one for each of the expense categories) and are charged to the proper department through distribution to a separate column for each. It may be wise to list on these standing orders the source from which these items are purchased as well as a brief description of the item.

Fixed Expenses

Preparation for control of fixed expenses will differ somewhat. (It must be acknowledged here that for practical purposes, we have been considering foreman-controllable variable and semivariable expense as making up the variable category. The fixed expenses are therefore generally those not controlled by the foreman.) These expenses will probably not vary appre-

ciably from month to month. The practical thing is to establish a fixed expense rate on an annual basis and to watch actual direct labor hours against the budgeted direct labor hours to determine whether or not all fixed overhead expense is being absorbed.

Materials Control

Raw materials and finished goods inventories are controlled through the use of the stock ledger. It was indicated at the start that work-in-process is controlled through the operation sheets in the active file and that material requisitions are made up at the time the operation sheet is put into the active file. They go out to the foreman along with the job order time cards. When the material is withdrawn from the stockroom, the material requisition goes back to the cost department, materials withdrawn are recorded in the stock ledger and the cost entered on the job "fly sheet" which remains in process until the parts are finished and enter the stockroom.

The stockman notifies the cost clerk that he has received the parts and the latter picks them up on his finished inventory stock card and closes out the cost on the "fly sheet." A recapitulation can then be made of all of the costs which have been transferred out of work-in-process into finished parts. The assembly department also, in its operations, follows the above procedure except that it requisitions parts rather than raw stock. When the assembly is completed, the unit cost and number of units are posted to the finished goods stock record.

Adaptability to Standards

As had already been suggested in presentation of the operation sheet, it can serve the same purpose as a standard cost card. Material and labor variations can be calculated for each part and a recapitulation sheet can be made for summarizing. As far as the overhead variation is concerned, the budget and the actual figures give variations readily and a column can be added to the regular labor distribution for standard hours of direct labor as well as actual hours of direct labor. If the same standard hourly rate applies to all employees in the department, labor variations are readily determined by using the average actual hourly rate against the standard hourly rate and the actual time against the standard time. Material quantity variations can be determined by the use of an "extra" material requisition employed whenever materials other than the standard amount are used.

In my experience these mechanisms have been effective in controlling costs. Management has been able to get product costs whenever wanted. All levels of management have been given the tools to show where the costs are out of line and also the urge to reduce costs.

THE COST FORUM

DEPRECIATION PROVISIONS AND INDUSTRIAL EXPANSION

Editor, N. A. C. A. Bulletin:

WHEN A BUSINESS IS PROFITABLE, the act of recognizing and "providing for" depreciation ordinarily results in the retention of current assets which are sometimes called "depreciation funds". They are, in effect, the excess of income over outgo after taking away profit computed in the traditional manner. In periods during which currency values are steady, a business therefore finds, as a very normal condition, that current asset "funds" are inclined to grow larger as a very natural result of the recognition of depreciation as a cost of doing business.

Not infrequently, this tendency of depreciation "funds" to grow has made possible substantial productive expansion programs, many of which were the results of clear, long-range policy decisions but some of which, no doubt, have been the result of stop-gap efforts to "keep all the dollars working". At any rate the normal and natural inflow of temporarily inactive depreciation dollars has made possible much of the business expansion which America has enjoyed in its industrial economy to date. One might almost say that depreciation dollars have tended to make expansion not only a natural but an almost inevitable phenomenon in American business.

Of course, business expansion is not necessarily a desirable thing at all times and places. Many evils can be traced to overexpansion of individual firms or even industries. Yet expansion was the key to the productive power which made possible the military victories of World War II and the high standard of living which we enjoy today. Further expansion is called for in the harsh days which face us as we enter 1951. It is somewhat sobering to note, therefore, that, because of the falling value of currency, depreciation dollars tend to be inadequate to support natural expansion. In other words, present-day depreciation dollars are often unable to cope with the current requirements of replacement, let alone provide temporary cushions of useful and current capital which can be availed of to sponsor an increase in the over-all size of a business undertaking.

This means that business expansion probably will not be as automatic or, as it was put above, as "natural" in the future as it has been in the past. Of itself this development certainly is not a bad thing. Policies of expansion of productive potential will have to be forthright and purposive in the future if further healthy—and necessary—business expansion is to be accomplished in the years ahead. However, it would seem important for management in general and the accountant in particular to recognize the subtle relationship which exists between depreciation and expansion in times of deflationary values in currency. Much of the "naturalness" of business expansion is removed at such times. It may be that, on this account, new voice must now be lent to the cry for continued healthy progress in American business.

JOHN A. BECKETT, Boston

GOOD ACCOUNTING TECHNIQUES CAN PAY OFF IN A CONTROLLED ECONOMY

Editor, N. A. C. A. Bulletin:

SOME APPARENTLY FEEL THAT, when government controls come in, internal controls should go out. However, many companies were in a sad and precarious position at the close of World War II just because they had, deliberately or not, relaxed internal accounting practices during the war period. Hence, I take the opposite viewpoint. Operating under controlled economy is the golden opportunity to fully apply the good and versatile techniques of industrial accounting.

Why is this so? Because we are then operating under abnormal stresses. These usually take the form of limiting factors. Sales volume, sales prices, inventories, supplies of raw materials, plant requirements, or manpower are restricted. This forces us to operate under various *imposed bottleneck conditions*. The trained industrial accountant will instinctively know that the minute a new bottleneck appears, the applications of profit planning and internal control techniques must change to fit the new conditions. Here is the opportunity for the accountant to "reverse his field" and show management the effect on profits that the failure to recognize—and utilize—these bottlenecks can cause.

Perhaps, instead of regarding marginal balance (used with open capacity available) as the guide to choice among products to push, much can be learned from measuring the profits of various products on "profit per principal bottleneck machine hour" or "profit per pound of scarce material content." Comparing products in this way will reveal some startling cases in which a product, carrying a good marginal balance or overall profit, will show up poorly on a relative basis as a *profit producer per unit of limited facilities or material consumed.*

It is seriously recommended, then, that accountants gauge their products on a "profit per available unit of procurable facilities consumed" basis during a controlled economy and, from these studies, guide management to effect what substitutions of products or customers are desirable and are permitted under regulations. In this way, industrial accountants can serve management well to maintain as satisfactory a profit level as is possible during a period of stress.

Many of the facts learned in the course of this endeavor will carry over to the periods of free activity and will continue to pay off well. Industrial accountants should tighten their belts and buckle down to good control accounting, properly applied to suit the conditions prevailing during periods of controlled economy.

"Thar's gold in them thar hills."

NORMAN A. COAN, *N. Wisconsin Chapter*

HANDY HANDLING OF FREIGHT PAYMENTS

Editor, N. A. C. A. Bulletin:

THE FOLLOWING PROCEDURES outline our solution to the problem of paying fifty to one hundred freight bills daily, using a minimum of clerical help and at the same time maintaining an effective control over disbursements.

At our plant, shipments are made daily by way of some thirty carriers. A bill of lading is prepared covering each shipment and, at the end of each day, the bills of lading are separated according to the carrier. Before the posting of the previous day's invoices to customers' accounts, a copy of each bill of lading is compared with the office copy of each invoice. This is done

to make sure that (1) all shipments were invoiced, (2) no shipments were billed twice, and (3) that there is a copy of the bill of lading for each shipment.

The bills of lading are then filed alphabetically by carrier in a monthly file. This is a filing process only, because the comparing process described above automatically arranges the bills in alphabetical order. Each day's bills of lading are filed behind the previous day's. The effect is to pinpoint the location of each "proof of shipment." When the freight bills come in, they also are arranged alphabetically by carrier and by date and are compared with the respective bills of lading to establish the correctness of the weights shown on the bills and to furnish proof that payment is due the carrier.

The freight bills are next handed to the rate clerk in the sales department who verifies the rates charged. The extensions are then verified and checks are drawn to the carriers in the proper amounts by the accounts payable department—on the same day the bills were received. The number of the check is entered on the freight bills it covers. Each freight bill, is stamped paid and stapled to the corresponding bill of lading. Bills for each day are placed to the rear of the carrier folder in the monthly file. At the end of the month, the carrier folders are placed in a permanent file where they are kept three years and then destroyed.

F. EUGENE FOSTER, *Richmond Chapter*

TRAINING ACCOUNTING PERSONNEL AS REPLACEMENTS AND FOR PROMOTIONS

Editor, N. A. C. A. Bulletin:

IN THE N. A. C. A. BULLETIN for November, 1950, Mr. S. D. Flinn, discussed the "Administration of A Lage Accounting Department." Under a subheading of "Techniques of Training," he makes the statement that, "When the trainee is given his first work assignment, it is wise to place him in one of the staff rather than the line groups for several reasons." Certain logical reasons are given for this conclusion.

However, such staff training is primarily for specialized personnel, to provide top supervision after years of preparation and groundwork. There is need for a practical method of providing diversified training for a sufficient number of employees, placed in or selected from the line groups, to take care of the numerous replacements and promotional requirements that occur regularly in every large accounting organization. We believe that there are very few firms, even among the larger companies, which regularly maintain special employee training for a group of sufficient size to provide trained men for all of the position openings currently developing. In our opinion, such training can best be handled as described below.

First, within each working unit (such as a pricing section within the billing division) of the accounting department, which unit may be composed of from 5 to 25 persons, there should be a planned program for transferring among jobs within the unit all of those individuals whose training, ambition, personality and other qualifications are such as to make them suitable for consideration for more advanced positions in the future. Such a program should be based on a rotation of personnel in the several positions. It should provide that a man will remain on a particular job for a year (or some other period which is sufficient for him to become thoroughly familiar with the work) and it should also provide that periodic transfers within the unit do not delay the routine work of the unit

or burden it unduly with excess clerical force.

After a few years of rotation of personnel under the plan, the loss by transfer, promotion, etc. of one man or of several men (in the case of a larger unit), should not seriously interfere with the work output, as there will be other employees trained to take over or carry on the functions in question. Moreover, at whatever point a new employee is placed in the unit, there will be several persons sufficiently familiar with his duties to train him, thus relieving the supervisor of the details of this task.

This rotation program will not always suffice. In the larger divisions of an accounting department—including such divisions as accounts payable, accounts receivable, billing, etc.—where the employees may number from 50 to 500 and where several units or sectional subdivisions normally would be established, further training of personnel is necessary. Each such division should select individuals, on the basis approximately of one man for each 25 to 30 employees, for well-rounded training covering the work of the entire division.

Such selection should be based upon education, age, personality, ambition, aggressiveness, and those other qualities considered necessary in a potential supervisor. A training period of several years' duration should be outlined, so that each individual among those chosen may work in each unit or section of the division and on each major type of work for a period of from three months to one year.

Only under a dual training program such as this, is it possible for a large accounting organization to remain flexible and to have available at all times a trained group from which to fill the many openings which must occur within such a department over any period of years.

W. R. ARCHERD, *Lehigh Valley Chapter*

PROPOSED WORLD CALENDAR HAS TWELVE MONTHS, EQUAL QUARTERS

Editor, N. A. C. A. Bulletin:

KEENLY INTERESTING in your March issue is Mr. Jennings' article on correcting calendar irregularities.

Unfortunately Mr. Jennings mistakenly attaches the term "The World Calendar" to the 13-month calendar plan, which was widely advocated twenty years ago but which has long since been rejected by the international forums.

The plan of calendar reform which is now on the program of the United Nations is "The World Calendar," a 12-month equal-quarter plan of revision, which will probably be approved for adoption on 1 January 1956. Under this plan, the world will have a perpetual and orderly calendar

THE WORLD CALENDAR

FIRST QUARTER

JANUARY							FEBRUARY							MARCH						
S	M	T	W	T	F	S	S	M	T	W	T	F	S	S	M	T	W	T	F	S
1	2	3	4	5	6	7					1	2	3	4					1	2
8	9	10	11	12	13	14	5	6	7	8	9	10	11	3	4	5	6	7	8	9
15	16	17	18	19	20	21	12	13	14	15	16	17	18	10	11	12	13	14	15	16
22	23	24	25	26	27	28	19	20	21	22	23	24	25	17	18	19	20	21	22	23
29	30	31					26	27	28	29	30			24	25	26	27	28	29	30

SECOND QUARTER

APRIL							MAY							JUNE						
S	M	T	W	T	F	S	S	M	T	W	T	F	S	S	M	T	W	T	F	S
1	2	3	4	5	6	7					1	2	3	4					1	2
8	9	10	11	12	13	14	5	6	7	8	9	10	11	3	4	5	6	7	8	9
15	16	17	18	19	20	21	12	13	14	15	16	17	18	10	11	12	13	14	15	16
22	23	24	25	26	27	28	19	20	21	22	23	24	25	17	18	19	20	21	22	23
29	30	31					26	27	28	29	30			24	25	26	27	28	29	30
																			★	W

THIRD QUARTER

JULY							AUGUST							SEPTEMBER						
S	M	T	W	T	F	S	S	M	T	W	T	F	S	S	M	T	W	T	F	S
1	2	3	4	5	6	7					1	2	3	4					1	2
8	9	10	11	12	13	14	5	6	7	8	9	10	11	3	4	5	6	7	8	9
15	16	17	18	19	20	21	12	13	14	15	16	17	18	10	11	12	13	14	15	16
22	23	24	25	26	27	28	19	20	21	22	23	24	25	17	18	19	20	21	22	23
29	30	31					26	27	28	29	30			24	25	26	27	28	29	30

FOURTH QUARTER

OCTOBER							NOVEMBER							DECEMBER						
S	M	T	W	T	F	S	S	M	T	W	T	F	S	S	M	T	W	T	F	S
1	2	3	4	5	6	7					1	2	3	4					1	2
8	9	10	11	12	13	14	5	6	7	8	9	10	11	3	4	5	6	7	8	9
15	16	17	18	19	20	21	12	13	14	15	16	17	18	10	11	12	13	14	15	16
22	23	24	25	26	27	28	19	20	21	22	23	24	25	17	18	19	20	21	22	23
29	30	31					26	27	28	29	30			24	25	26	27	28	29	30
																			★	W

• Worldsday, (a World Holiday), W or 31 December (365th day), follows 30 December every year.

• • The Leapyear Day, (another World Holiday), W or 31 June follows 30 June in leap years.

in which every quarter-year will be identical. Here is the new, improved calendar:

We hope your readers will be interested in it.

ELIZABETH ACHELIS, *President*
The World Calendar Association

(EDITOR'S NOTE—Mr. Jennings' article, to which Miss Achelis' letter refers, described a 21 work-day accounting month used by his company. Mr. Jennings also wrote us along the lines of Miss Achelis' letter.)

Coming Articles IN THE **N.A.C.A. Bulletin,** JUNE, 1951

Paradoxes in the Application of Profit Planning Doctrines
by NORMAN A. COAN

A Trade Unionist Views Net Income Determination
by SOLOMON BARKIN

Operating Under the New Excess Profits Tax Law
by J. H. LANDMAN

The Burden Problem in Government Contract Costs
by LOUIS E. ZRAICK

Point-Rating for Reliable Service Life Estimates
by W. F. BENNETT

Before-the-Fact Control of Capital Outlay
by FRANK L. METTLER

Is Own Product Research a Current Fixed Expense?
by DAVID S. MOFFETT

32nd

Annual International Cost Conference

HIGHLIGHTING the year's activities is the Annual International Cost Conference, commemorating thirty-two years of N.A.C.A. service to industrial accounting. No other Association event provides such a valuable combination of profit and pleasure, combined with good fellowship, for all members availing themselves of the opportunity to participate.

Hear these timely topics . . . .

INDUSTRIAL ACCOUNTING IN A DEFENSE ECONOMY

COST DETERMINATION FOR GOVERNMENT CONTRACTS

ACCOUNTING PROBLEMS OF RENEGOTIATION

THE ROLE OF COSTS IN A DEFENSE ECONOMY—Panel Discussion

VARIANCE ANALYSIS FOR REDUCTION AND CONTROL OF MANUFACTURING COSTS

ANALYSIS OF NONMANUFACTURING COSTS FOR MANAGEMENT GUIDANCE

ACCOUNTING FOR SUPPLEMENTARY LABOR COSTS

SUPPLEMENTARY LABOR COSTS — Panel Discussion

THE EFFECT OF INVENTORY VALUATION ON PROFITS AND TAXES

THE EFFECT OF TAXES ON BUSINESS PLANNING

Also on the Schedule . . .

Official Reception—Sunday . . . Business Machine Exhibit . . . Plant Visits . . . Annual Dinner . . . Presidents' Ball . . . Lybrand Awards . . . Annual Meeting and Election of Officers . . Stevenson Trophy Awards . . . Ladies' Activities . . . Sightseeing Tours . . . Hospitality Events . . . Special Luncheons . . . Golf Tournament . . . and a host of other attractions.

JUNE 24-27, 1951 • The Palmer House • CHICAGO